A Dissertation on

"A STUDY OF ESTIMATION OF DEPRESSION AND ANXIETY IN CHRONIC MEDICAL ILLNESSES- TYPE 2 DIABETES MELLITUS, SYSTEMIC HYPERTENSION AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE"

Submitted to

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY

In partial fulfillment of the requirements

for the award of degree of

M.D. (PSYCHIATRY)

(Branch-XVIII)

GOVERNMENT STANLEY MEDICAL COLLEGE & HOSPITAL,

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI, TAMILNADU.

APRIL 2016

CERTIFICATE

This is to certify that this dissertation entitled **"A STUDY OF ESTIMATION OF DEPRESSION AND ANXIETY IN CHRONIC MEDICAL ILLNESSES- TYPE 2 DIABETES MELLITUS, SYSTEMIC HYPERTENSION AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE"** submitted by **Dr. JEYAPRAKASH J** to the faculty of PSYCHIATRY, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, in partial fulfillment of the requirements in the award of degree of M.D.(PSYCHIATRY) Branch-XVIII for the April 2016 examination is a bonafide research work carried out by him during the period of FEBRUARY 2015 to JULY 2015 at Government Stanley Medical College & Hospital, Chennai, under our direct supervision and guidance of Prof. Dr. W.J.ALEXANDER GNANADURAI., M.D., DPM., Department of Psychiatry at Government Stanley Medical College, Chennai.

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DECLARATION

I, **Dr. JEYAPRAKASH J,** solemnly declare that the dissertation **"A STUDY OF ESTIMATION OF DEPRESSION AND ANXIETY IN CHRONIC MEDICAL ILLNESSES – TYPE 2 DIABETES MELLITUS, SYSTEMIC HYPERTENSION AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE"** is a bona- fide work done by me during the period of February 2015 to July 2015 at Government Stanley Medical College and Hospital, under the expert supervision of **Prof. Dr. W.J.ALEXANDER GNANADURAI. M.D, D.P.M.,** Professor and Head of the Department of Psychiatry, Government Stanley Medical College, Chennai. This thesis is submitted to The Tamil Nadu Dr .M.G.R. Medical University in partial fulfillment of the rules and regulations for the M.D. degree examinations in Psychiatry to be held in April 2016.

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ACKNOWLEDGEMENT

I wish to thank **Dr. ISAAC CHRISTIAN MOSES MD**., Dean, Stanley Medical College and Hospital, Chennai for permitting me to carry out this study.

With sincere gratitude, I wish to acknowledge the expert guidance and suggestions of my Professor **Dr .W.J.ALEXANDER GNANADURAI MD., DPM**. without whose guidance this study would not have been possible. I wish to thank Associate Professor **Dr. R.SARAVANA JOTHI MD**., Department of Psychiatry, Stanley Medical College, Chennai for the able guidance, constant inspiration and continuous encouragement rendered at every stage of this study.

I am deeply indebted to and highly grateful to **Dr. M. MOHAMED ILYAS RAHMATULLAH., MD., DPM**, and **Dr. HARIHARAN MD**., Assistant Professors, Department of Psychiatry, Stanley Medical College, without whom this work would not be in the present shape.

I am highly grateful to my co-guides **Dr. SUBHASHREE..S, MD.,Dip.Diab.** ,Department of Diabetology, **Dr.JAYANTHI.R MD.,** Department of General medicine and **Dr.SRIDHAR.R MD**., Department of Chest medicine for their permission and guidance in the completion of my dissertation.

I wish to thank all my co-post graduates for helping me in this work. I gratefully acknowledge all patients and participants who gave their consent and co-operation for this study.

INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work : A Study of estimation of depression and anxiety in chronic medical illnesses - type 2 diabetes mellitus, systemic hypertension and chronic obstructive pulmonary disease.

Principal Investigator : Dr. Jeyaprakash .J

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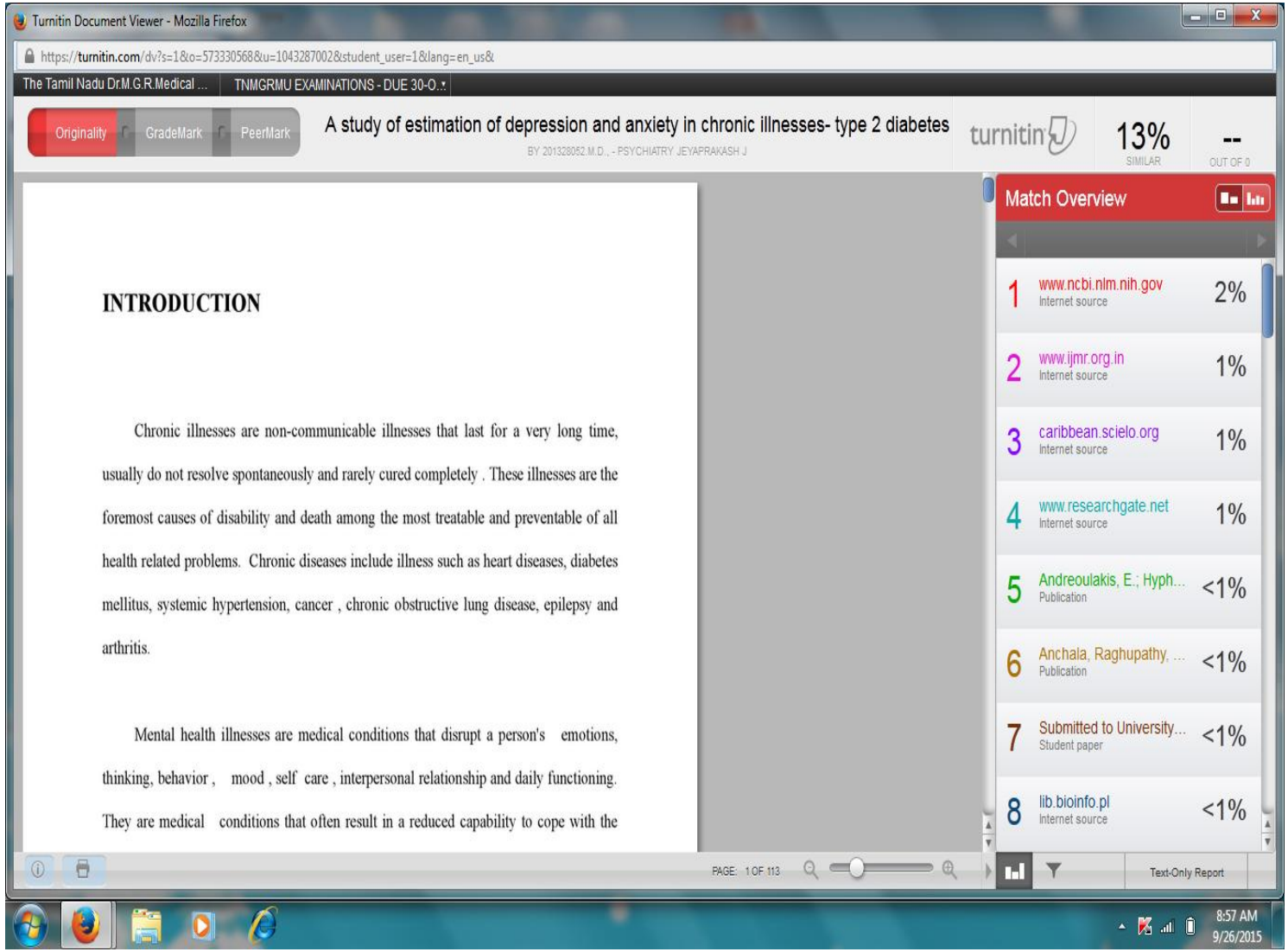
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INTRODUCTION
Chronic illnesses are non-communicable illnesses that last for a very long time, usually do not resolve spontaneously and rarely cured completely . These illnesses are the foremost causes of disability and death among the most treatable and preventable of all health related problems. Chronic diseases include illness such as heart diseases, diabetes mellitus, systemic hypertension, cancer , chronic obstructive lung disease, epilepsy and arthritis.
Mental health illnesses are medical conditions that disrupt a person's emotions, thinking, behavior , mood , self care , interpersonal relationship and daily functioning. They are medical conditions that often result in a reduced capability to cope with the
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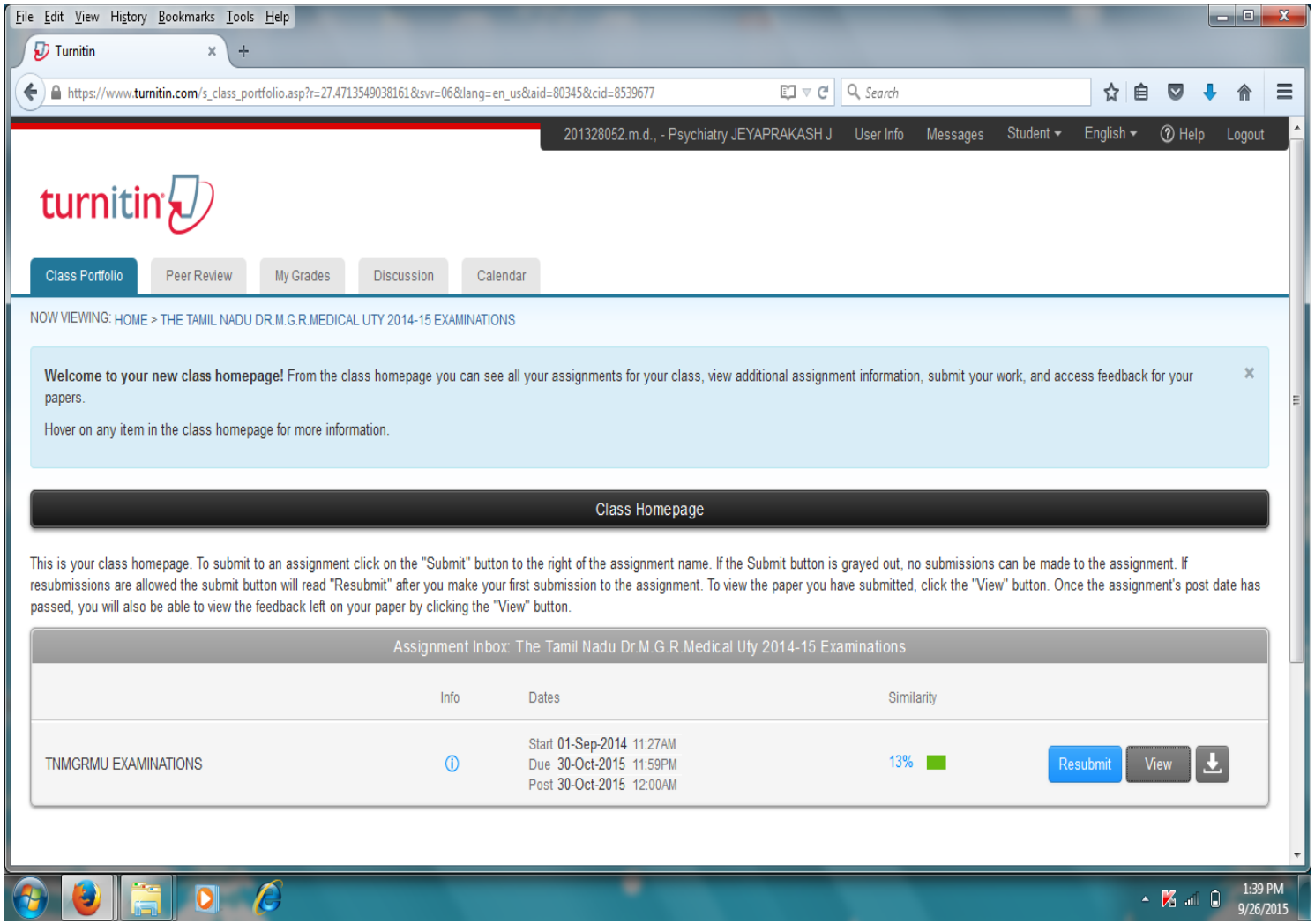
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INTRODUCTION

Chronic illnesses are non-communicable illnesses that last for a very long time, usually do not resolve spontaneously and rarely cured completely. These illnesses are the foremost causes of disability and death among the most treatable and preventable of all health related problems. Chronic diseases include illness such as heart diseases, diabetes mellitus, systemic hypertension, cancer , chronic obstructive lung disease, epilepsy and arthritis.

Mental health illnesses are medical conditions that disrupt a person's emotions, thinking, behavior, mood, self care, interpersonal relationship and daily functioning. They are medical conditions that often result in a reduced capability to cope with the routine daily activities.

The relationship between mental health illnesses and chronic physical conditions are significant. Regardless of etiology, chronic illnesses and mental health illnesses are treatable and both the conditions are common and disabling among general population. Individuals with chronic medical illnesses have increased risk for mental illnesses such as depression and anxiety as compared to the physically healthy people. Mental health care priorities need to be focused attention from psychotic disorders to common mental illnesses like depression and anxiety disorders, which are also associated with high disabilities among patients.

The prevalence rates of depression and anxiety not only vary among the general population but also vary in the same population from time to time. Depression and anxiety have been reported to be associated with chronic medical illnesses.[1] The odds for a specific mental health disorder (mostly depression) are increased with systemic hypertension (Wells et al., 1989), chronic pulmonary diseases (Wells et al., 1988 ; Ede, Ijzermans & Brouwer, 1999) and diabetes (Anderson, Freedland, Clouse, & Lustman, 2001; Garvard, Lustman, & Clouse, 1993; Popkin, Callies, Lentz, Colon, & Sutherland, 1988; Lustman & Clouse, Griffith, Carney, & Freedland, 1997) .

Depression and anxiety caused by chronic diseases often make the condition worse. When depression or anxiety is comorbid with any of chronic medical disorders, there is additive functional impairment and increase in the symptom burden which leads to increase in medical costs and to impair adherence , functioning , self care and quality of life.[2] Depression, in particular, is associated with worse functional outcomes for patients with chronic physical illnesses. Comorbid depression and anxiety is a risk factor for increased severity of the chronic illness because of non-adherence with the treatment and related complications and is also associated with increased frequency of hospitalizations, increased morbidity and increased mortality.

The associated depression and anxiety in chronic medical illnesses like diabetes mellitus, systemic hypertension and chronic obstructive pulmonary disease have a large impact on

(i) economic issues as they cause higher health care costs in chronic physical illnesses.

(ii) maladaptive effects on chronic illnesses like amplification of symptoms burden, increased adverse health behaviors, decreased self-care and decreased adherence to medical regimens by adversely influencing expectations and benefits about efficacy of treatment

(iii) Morbidity and mortality and

(iv) Treatment implications.

So, the prompt diagnosis of depression and anxiety in chronic diseases is mandatory in optimizing the management and in understanding the cause of the illness.

Diabetes mellitus is a syndrome of disordered metabolism, usually due to a combination of genetic and socio-environmental causes, due to defects in either insulin secretion or insulin action resulting in abnormally high blood sugar levels. Diabetes is a chronic medical illness which needs lifelong treatment either with dietary modifications or medication , in order to prevent or manage its complications.

According to International Diabetes Federation (IDF), India has the largest number of diabetic patients globally, and now, the number of diabetic patients in India is around 40.9 million and it is expected that, there will be

69.9 million diabetic population in India by 2025. (Diabetes Atlas – 6th edition). India is the leading country in having highest number of diabetic patients among world population and so it is being termed as the "diabetes capital of the world".

In India, there have been consistent reports of differences in the prevalence of diabetes mellitus between urban and rural population. The ICMR study reported that the prevalence of diabetes in urban areas was 2.1 per cent and in rural areas was 1.5 per cent, where as an another study showed that threefold increase in prevalence of diabetes among urban population (8.2 %) than the rural population (2.4%).

According to the WHO-ICMR national NCD (Non Communicable Diseases) risk factor surveillance at 2006, a surveillance was conducted in 5 States of India, in a different geographical locations (which includes northern, southern, eastern and western/central India) and it indicated that the prevalence of diabetes were 7.3% among urban people, 3.2% among by peri-urban area and 3.1% among rural population.[3]

The Chennai Urban Rural Epidemiology Study (CURES) reported that the prevalence of Impaired Glucose Tolerance was 10.6 % (age - standardized: 10.2%) and that of diabetes mellitus was 15.5 % (age - standardized: 14.3%). Between the period of 1989- 1995 , the prevalence of diabetes mellitus was increased by 39.8% (From 8.3% to 11.6%) in Chennai

and in between period of 1995 - 2000 the prevalence rate increased by 16.3 % (From 11.6% to 13.5%) and between the period of 2000 - 2004, the prevalence rate further increased to 6.0% (From 13.5% to 14.3%). These results show that in Chennai itself within the period of 14 years, the prevalence of diabetes mellitus increased markedly to 72.3%.[4]

In clinical practice, identification of psychiatric co-morbidity like depression and anxiety in diabetes is often overlooked for a variety of reasons : societal disapproval of psychiatric illness, complicity between physicians and patients not to discuss psychiatric symptoms, and wrongly considering co morbid depression and anxiety as a ' normal consequence of difficult medical illness'.[5]

The comorbid depression or anxiety associated with diabetes can worsen the clinical outcome of the disease and it may be due to the fact that depression and anxiety would affect the treatment adherence and self care regimes of the patients. Similarly, uncontrolled diabetic status might lead to or aggravate depression and anxiety and it is due to the effects of diabetes over the central nervous system functions directly or through its indirect effects on complications , functional impairment or decreased quality of life.

Among South Asian population, Systemic hypertension emerges as the third leading risk factor for disease burden.[6] Hypertension (HTN) evolves as a major public health issue on healthcare systems in India.[7] Systemic

hypertension is the important causative factor for 24% of all deaths due to coronary heart disease (CHD) and 57% of deaths due to stroke in India.[8] According to WHO reports, systemic hypertension is one among the risk factor in premature deaths worldwide .[9]

According to worldwide data analysis of the global burden of hypertension, 20.6% of men and 20.9% of women in India were found to have hypertension, in 2005.[10] The percentage of hypertension may increase up to 22.9 for men and 23.6 for women in India by 2025.[11] The prevalence of hypertension is 25% in urban areas and 10% in rural people in India.[12] According to the WHO (2008), the prevalence of systemic hypertension in India was 32.5% (33.2% in men and 31.7% in women)

Among hypertensive patients all over the world, 17.8% of them reside in India as per Global Burden of Hypertension (2005),[11] the Global Burden Diseases (2010) study[6] and WHO (2011) NCD India specific data. The prevalence of hypertension was increased multiple folds from 13.9 to 46.3% in urban population and from 4.5 to 58.8% in rural areas which was reported in a review study of studies published between 1969 and July 2011.[13]. One-third of urban adult Indians and close to one fourth of rural adult Indians are hypertensive. Hypertension was estimated to be 20% among adults population all over the world.[14]

Because hypertension is one among the most prevailing chronic conditions, it is necessary to investigate the prevalence of anxiety and depression in these patients. There is strong evidence that the co morbidity between systemic hypertension and mental illness is very high. The relationship between systemic hypertension and depressive symptoms is a complex issue. The course of the hypertension can be negatively affected and greatly influenced by depression and anxiety. The sympathetic nervous system over activity and genetic predisposition are the underlying mechanisms in explaining the co morbidity of depression and systemic hypertension.

Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of death worldwide and a major cause of chronic morbidity and mortality throughout the world.[15] COPD includes diseases that were previously known as chronic bronchitis and emphysema.

The British Medical Research Council (BMRC) defined chronic bronchitis as "daily productive cough for at least three consecutive months for more than two successive years. The definition of emphysema put forth by the National Heart, Lung and Blood Institute in 1984 is as "a condition of the lung characterized by abnormal, permanent enlargement of airspaces distal to the terminal bronchiole, accompanied by the destruction of their walls, and without obvious fibrosis". COPD has abnormalities of both airway and airspace. The Global Initiative for Chronic Obstructive Lung Disease (GOLD)

recently defined COPD as “a common preventable and treatable disease characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases.

The prevalence of COPD varies widely across countries and this variation is due to the method of classification and diagnosis of COPD. The global prevalence of physiologically defined chronic obstructive pulmonary disease (GOLD stage 2 or more) in adults aged ≥40 yr is approximately 9-10 percent.[16] The overall prevalence of COPD of GOLD stage II or higher was 10.1 per cent and the prevalence was 11.8 per cent for men and 8.5 per cent for women (The Burden of Obstructive Lung Disease (BOLD) study).[17]

The prevalence of COPD was 3.36 per cent in males and 2.54 per cent in females in a study. [18]. The prevalence in New Delhi in 1977 was 8.1 per cent in men and 4.6 per cent in women[19] and the prevalence was 3.9 per cent in women and 6.2 per cent in men in rural area, and 1.6 and 4.2 per cent, respectively in urban area in 1993.[20] The prevalence of COPD is 1.9 per cent in males and 1.2 per cent in females in Chennai.[21]. **Ray *et al*** *in* 1995 found that the prevalence of COPD was 4.08 per cent in males and 2.55 per cent in females from south India. There are wide variations in the prevalence of COPD in Indian subcontinent.[22]

Anxiety and depression are highly prevalent co morbidities in Chronic obstructive pulmonary disease.[23] Investigating depression and anxiety in COPD is difficult due to the variability in presentation and the significant overlap of symptoms between COPD, depression and anxiety and the subjective nature of the diagnostic process.[24] The anxiety and depression in COPD were associated with poor course of the disease, poor quality of life and increased burden of symptoms , health-care utilities, and even mortality.[25] The psychiatric symptoms themselves can be aggravated by patients' disabilities and, in turn, they can magnify patients' COPD symptoms. Thus, detecting depression or anxiety in COPD patients is of great importance.

Considering all the above factors it is necessary to study the prevalence of psychiatric co morbidities of depression and anxiety in chronic illnesses like Diabetes mellitus, Systemic hypertension and Chronic obstructive lung diseases and estimated in this study.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

DEPRESSION: A VIGNETTE

According to ICD – 10, an individual is said to be in depression either mild, moderate or severe who usually suffers with typical symptoms of depressed mood, loss of interest and decreased energy that may lead to increased fatigability and decreased activity.

The various other symptoms are

(1) Decreased attention and concentration,

(2) Decreased self – esteem and self – confidence,

(3) Guilty feelings and worthlessness

(4) Negative view about the future,

(5) Self – harm or suicidal thoughts,

(6) Sleep disturbances,

(7) Lack of appetite.

Depression can be categorized in to mild, moderate and severe, according to the number of typical symptoms and the various other symptoms. For the diagnosis of depression, these symptoms should persist for

about 2 weeks and cause significant impairment in social and occupational functioning.

Depression can occur alone or as a part of Bipolar disorder. If it occurs alone, then it is known as Unipolar depression. Depression is more common in women than men with the ratio of 2 : 1. At least 25 % of the patients had one or more precipitating events. There is also a diurnal variation in the symptoms: the symptoms worse in the morning. Approximately 75% of depressed patients experienced sleep disturbances, either insomnia or hypersomnia. About 60 % of the depressed patients have suicidal ideation and 15% commit suicide.

ANXIETY: A VIGNETTE

Most of us have experienced the anxiety symptoms but for a definite diagnosis, it should be clinically significant, must be severe enough to cause significant distress, and / or it must be markedly interfere our day–to–day lives and socio occupational functioning.

Anxiety is a state which has many effects. It influences the cognition and produces the perceptual distortions. There is a difference between fear and anxiety. In fear, there is an appropriate response to a known threatening stimuli, where as in anxiety there is also a response to a threat which is not known, not certain or disagreeable.

Most of the symptoms of anxiety are dreadful which are accompanied with somatic complaints and autonomous nervous system hyperactivity such as tachycardia, palpitation, sweating, dry mouth, etc.,. Anxiety accompanies with psychological symptoms such as feeling of dread, difficulty in concentration, insomnia, decreased libido, lump in the throat (Globus Hystericus) and stomach upset (Butter flies).

DSM-IV eliminated the term "Neurosis" in its diagnostic manual, but still it is retained in the ICD – 10, as Neurotic, stress related and somatoform disorders (F 40 – F 48). It may be convenient to divide the anxiety and stress related disorders in to 3 categories, because of the acceptable quality of the symptoms in each category.

1. **The common neuroses:**

Anxiety / Panic disorders; e.g. Panic disorder,

Agoraphobia,

Generalized Anxiety Disorder,

Specific Phobia,

Social Phobia,

Hypochondriasis.

(Illness anxiety disorder in DSM 5)

Stress related disorders: e.g. Acute stress reactions,

Adjustment disorders,

Post Traumatic Stress Disorder (PTSD).

Obsessive compulsive disorders (Separate entity in DSM – 5)

2. **The Unusual Neuroses**:

Anxiety / Phobic disorders e.g. " non – understandable" phobias

Dysmorphophobia.

Hysterical conversion disorder,

Dissociation /Depersonalization – Derealization disorders,

Somatoform disorders.

3. "**Culture specific" disorders:**

Chronic fatigue syndrome / Eating disorder,

Other "culture bound" disorders.

DEPRESSION IN DIABETES MELLITUS PATIENTS

According to the World Health Organization (WHO) , depression is a significant health concern causing 12% total years lived with disability. Approximately 43 million people worldwide with diabetes have symptoms of depression.[26]. In people with diabetes, the prevalence of clinically relevant depressive symptoms is between 26 – 31 % and that of major depression between 9 – 11 %.[27]

Diabetes increases twice the prevalence of depression. These increased rates of depression among diabetic population have been confirmed in multiple studies[28] in South Asia. The earlier hypothesis observed that depression in diabetes may be the result of psychosocial stress of having a chronic illness[29]. Another hypothesis also known as the common soil hypothesis posits that association between depression and diabetes results from factors affecting both disorders.

Current research also supports a contribution of biological changes in diabetes, such as functional, structural and neurochemical changes in the brain regions responsible for the affect and cognition in both type 1 and type 2 diabetes that may increase the risk of depression. [30]

Depression in diabetes is persistent and /or recurrent. In longitudinal and follow up studies, the rates of depression persistence or recurrence have been reported to range widely, between 11.6 % and 92 %, depending on sample sizes, diagnostic criteria of depression and depression classification.

PREVALENCE OF DEPRESSION IN TYPE 2 DIABETES MELLITUS CONTROLLED STUDIES:

Controlled studies which have used the control groups may allow us for better comparisons. In a meta – analysis study by **Ali S *et al*** in 2006 [31], 10 controlled studies including 7 community based studies (Palinkar *et al*, 1991; Viinamaki *et al*, 1995, Amato *et al*, 1996; Eaton *et a*1996;

Black *et al*,1999; Gregg *et al*, 2000; Pouwer *et al*, 2003), 2 primary care based studies (Janet Thomas *et al*, 2003; Nicolas *et al*,2003) and 1 secondary care based study (Saeed and Al-Dabbagh *et al*, 2003) were reviewed. Various assessment scales were used in these studies. BDI – Beck Depression Inventory, a self report questionnaire used in Palinkar *et al*, 1991, CES-D (Centre for Epidemiological Studies for Depression) Scale was used in Black *et al*, 1999; and Pouwer *et al*, 2003.

This meta-analysis review inferred the prevalence of depression among type 2 diabetes mellitus patients when compare with non diabetic individuals. (Odds Ratio; 1.77, 95% CI; 1.5 – 2.0). These findings were consistent when the rates were determined by gender, sample source, depression assessment methods and by geographical location. According to this meta-analysis, the overall prevalence of depression among type 2 diabetic patients was 17.6%, in which the female patients had a higher prevalence (23%) than male patients (12.8%).

Anne Engum *et al* in 2005 [32] conducted a large population study and found that, the prevalence of depression among type 2 diabetic patients was 19% and in the non diabetic control groups the prevalence was 10%. **Shamsaei *et al*** in 2006 [33]conducted a study in Iran and found that mean Beck depression score among type 2 diabetic patients was more (18.6) than the non diabetic control groups (9.1). **Mary de Groot *et al*** *in* 2007 [34],conducted a community based study in type 2 diabetes mellitus patients and revealed that

31% of the participants showed a clinically significant depression in Beck Depression Inventory Scale.

UNCONTROLLED STUDIES:

In a meta - analysis study of **Anderson *et al*** in 2001 [35]; he reviewed 22 uncontrolled studies to estimate the prevalence of depression in diabetic patients. According to this study the overall prevalence of depression among diabetic patients was 29.7%. Among the 22 uncontrolled studies, 5 of them (Biglan *et al*, Connell *et al*, Geringer *et al*, **Marcus *et al*** [36] and Nalibott *et al*) evaluated the prevalence of depression in type 2 diabetic patients which showed that the prevalence of depression in type 2 diabetic patients was higher (Mean: 33.8%, Range: 18.8% - 47%) than the type 1 diabetic patients (Mean: 21.2%, Range: 11.5% - 42.4%).

Among the 22 uncontrolled studies, 5 of them estimated the prevalence of depression in male and female diabetic patients separately (Bailoy *et al*, Haire – Joshu *et al*, Naliboff *et al*, **Peyrot *et al*** [37] and Slawson *et al*) which showed that the prevalence of depression was greater in females (33%) than in males (20.7%).

In a recent study at Malaysia, **Kurubaran Ganasegeran *et al*** in 2014 [38] demonstrated the factors connected with depression and anxiety among type 2 diabetic patients. They conducted a descriptive cross – sectional study in a single centre and found that, among 169 type 2 diabetic patients (men, n=99;

women, n=70), depression present in 68 patients (40.3%), and anxiety present in 53 patients (31.4%). Multivariate analysis of this study shows that, the age of onset, ethnicity, monthly income and the complications associated with diabetes were significantly influenced the causation of both depression and anxiety among the type 2 diabetic patients.

INDIAN STUDIES:

Poongothai S *et al* [39] and her colleagues at 2009, conducted a population based study to estimate the prevalence of depression in an urban south Indian population –Prevalence of depression was assessed by using Patient Health Questionnaire (PHQ) - 12: a self – reported questionnaire, and found that, the overall prevalence of depression was 15.1%, and the prevalence of depression was higher in females (16.3%) than in males (13.9%).

Chandran *et al* in 2002 [40] conducted a study, to estimate prevalence of depression among rural and low socio economic status women (359 participants) and found that overall prevalence of depression among them was 11%.

Biswas *et al* in 2009 [41]conducted a door to door survey to estimate the prevalence of depression in elderly individuals (204 participants) and found that the prevalence of depression among them was 31.5%.

Amit Raval *et al* in 2010[42], in Chandigarh, India conducted a study to estimate the prevalence and determinants of depression among type 2 diabetic patients and found that, among 300 type 2 diabetes mellitus patients (147 male patients and 153 female patients), 68 patients (23%) had major depression, 54 patients (18%) had moderate depression and 178 patients (59%) had no clinically significant depression. They also found that the age of onset, duration of diabetes, obesity, glycemic control and the diabetic complications having an impact in the causation of depression in type 2 diabetic patients.

In a recent study of **Nitin Joseph, Bhaskaran Unnikrishnan, Y.P.Ragavendhra Babu M, Shashidhar Kotian,** and **Maria Nelliyanil *et al*** in 2013 [43]; they conducted a study to estimate the proportion and determinants of depression in type 2 diabetic patients in various tertiary care hospitals at Mangalore, South India. Among the 230 type 2 diabetic patients (119 male patients, 111 female patients), 71 patients (30.9%) met the criteria of moderate depression, 33 patients (14.3%) met the criteria of severe depression and the remaining126 patients did not have any clinically significant depression. They also found that, the older age, low socio economic status, female gender, unskilled & retired employment status, obesity, daily medications and the complications of diabetes, were markedly associated with the causation of depression in type 2 diabetic patients.

PREVALENCE OF ANXIETY IN DIABETES MELLITUS:

Most of the studies in Diabetes focus on the psychiatric disturbance of depression, where as only few studies demonstrated the anxiety disorders in Diabetes mellitus patients.

Kaufman *et al* [44] and Roy A *et al*, demonstrated that, the co - morbid Anxiety disorder with Diabetes lead to a symptom severity and persistence of symptoms and greatly impair the individual role in the social and occupational milieu.

Barker *et al* in 2008 demonstrated the association of anxiety disorders in type 2 diabetes mellitus patients. In this study, a structured diagnostic interview method like DIS – DSM IV (Diagnostic Interview Schedule for DSM – IV) was used. They found that the overall life time prevalence of anxiety disorder among diabetic patients was 19.5%, when compare to the non – diabetic individuals (10.9%).

Grisby *et al* in 2001 [45] conducted a systematic review on 18 studies regarding the prevalence of anxiety disorders in an adult population with diabetes. He found that, the symptoms of anxiety were present in about 40% of the diabetic patients. He also found that there is an significantly elevated anxiety symptoms present among female diabetic patients (55.3%) than the male diabetic patients (32.9%) and there is an increased symptoms of anxiety present among type 2 diabetic patients (42.2%) than with type 1 diabetic

patients (41.3%). Among the 40% of diabetic patients presented with anxiety symptoms, while applying definite diagnostic criteria only 14% of the diabetic patients were qualified for the definite diagnosis of Anxiety disorders.

Hermanns *et al* in 2005[46] carried out a study to estimate the prevalence of anxiety symptoms in a secondary care clinic and found that, 19.3% of the diabetic patients had anxiety symptoms and 5.9% of them were fulfilling the criteria of anxiety disorders.

Lloyd *et al* in 2000[47] demonstrated that 28% of the participants had moderate to severe levels of anxiety or depression or both. Shaban *et al* in 2006, found that 36% of the study participants had anxiety symptoms, and also found that, there is an elevated severe anxiety symptoms present among female diabetic patients.

Janet Thomas *et al* in 2003[48], conducted a comparative study in a primary care patients who were diagnosed as type 2 diabetes mellitus, to evaluate the 12 months prevalence of depression and anxiety and found that 11.7% of the T2DM patients had anxiety disorders and 13% of the T2DM patients had mixed anxiety and depression disorder. This study shows that, type 2 diabetes mellitus increases the probability of acquiring anxiety symptoms by an Odds ratio of 2.26. (1.28 – 4.01, p value; 0.005).

In a recent study, **Carlos Tovilla-Zarate *et al*** in 2012 [49] conducted a study to estimate the prevalence of anxiety and depression among T2DM patients in an outpatient set up in the Mexican population. The prevalence of anxiety was 55.10% (95% CI; 44.48 – 52.06) and also found that, occupation and diabetic complication were the associating factor for anxiety in type 2 diabetic patients.

In a recent study at Malaysia, **Kurubaran Ganasegeran *et al*** in 2014[50], demonstrated the factors connected with depression and anxiety among type 2 diabetic patients. They conducted a descriptive cross – sectional study in a single centre and found that, among 169 T2DM patients (men, n=99; women, n=70), anxiety present in 53 patients (31.4%). Multivariate analysis of this study shows that, the age of onset, ethnicity, monthly income and the complications associated with diabetes mellitus were significantly associated with the causation of both depression and anxiety among the type 2 diabetic patients.

Khuwaja AK *et al* in 2010 [51] conducted a multi – centre study at Karachi, Pakistan, to evaluate the prevalence of anxiety and depression among T2DM patients and found that, among the 889 participants 57.9% of the type 2 diabetic patients had anxiety symptoms (95% CI = 54.7%, 61.2%).

DEPRESSION AND ANXIETY IN SYSTEMIC HYPERTENSION

Systemic hypertension is one among the most commonly prevailing chronic illnesses in the community and psychiatric co morbidities of depression and anxiety are also more prevalent in hypertensive patients.

OVERACTIVE AUTONOMIC NERVOUS SYSTEM

Plenty of studies have been done and a theory has been propounded with evidence that a possible overactive sympathetic response of the autonomic nervous system and genetic involvement form the intrinsic mechanisms which define a relation between hypertension and depression and anxiety, in which depression largely has a negative influence on the course of hypertension.[52]

The abnormality in the sympathetic division of the autonomic nervous system in depressive patients, exclusively with regard to reduced vagal control and an increase in sympathetic activity, has been evidenced by studies which reported the presence of elevated levels of nor epinephrine and its significant CNS metabolite 3-methoxy 4-hydroxyphenylglycol in plasma, CSF and urine samples of depressive patients.[53,54,55.]

A distinctive reduced level of cholinergic outflow with increased activity of the alpha and beta adrenergic systems was found to characterize the autonomic profile of depressive patients, further evidenced by a decreased

variability in heart rate suggesting a reduced activity of the parasympathetic system and an over active sympathetic system in patients with depressive disorder.[56,57]

It is possible that several other explanations may exist to define the relation between blood pressure and depression with an overactive sympathetic system not being the sole one; however it was proposed by **Seiver et al** [58] that the increased understanding in the influences exerted by neurotransmitter systems in mood disorders are possibly due to failure of the regulation of the systems, and not just a simple decrease or increase in their activity, and such dysfunction in the noradrenergic system regulation was expected to negatively affect the individuals affective response to internal and external stimuli.

Studies hypothesized a possible relation between depression and an abnormality in the circadian regulation of blood pressure evidenced by the depressive symptoms exhibited by 126 men, devoid of any psychiatric illness and not on any medication, associated with an increased ratio of night/day systolic blood pressure. Disturbances in the regulation of hormones and dysfunction of the Autonomic Nervous System have been advocated as explanations for the above results.[59]

A possible relation between hypertension and depressive symptomatology were evidenced by studies conducted in patients of

borderline hypertension, who demonstrated an increased range of scores in negative affect post tasks.[60].

A study conducted by **Rabkin et al** [61], evidenced the presence of a three times higher rate of major depression in hypertensive patients and it was attributed by elevated sympathetic tone and increased secretion of adreno cortico tropic hormone and cortisol. In the study conducted over a period of 7 days in 54 subjects by monitoring their blood pressure ranges over a period of 24 hours each day, it was found that a positive relation existed between high levels of diastolic (P=0.030) and systolic (P = 0.037) blood pressures and a depressive mood .[62]

The genetic influences form an important etiology in mood disorders was evidenced by several family, adoption and twin studies, with similar others advocating a 'shared genetic-vulnerability' explanation to define the association between hypertension and depressive disorders.

Increased levels of symptoms of depression was shown to exist with higher risk of stroke in elderly hypertensive patients as evidenced by epidemiological studies conducted to evaluate the longitudinal association between stroke, cardiovascular related mortality, BP control and depressive symptomatology in elderly patients, with such association especially in women considered to be a function of BP control.[63]

Several studies advocated that depressed patients showed an increased susceptivity to activation of platelets possibly being the intrinsic mechanism involved in the higher risk of cerebrovascular disease , ischemic heart disease and post myocardial infarction in such patients.[64] . Another theory has been propounded based on the evidence offered by several brain imaging studies, which demonstrated an increased rate of ischemic abnormalities in depressive disorders occurring late in life, that hypertension could serve as a risk factor in development of the same.[65]

Associations between hypertension and anxiety have been hypothesized for decades. The possible relationship between hypertension and anxiety are increased autonomic nervous system functions via hypothalamic-pituitary axis and subsequent increase in circulating catecholamines. This association holds across the spectrum of anxiety disorders. In hypertensive patients , the outcome is negatively affected by anxiety. The underlying mechanisms between negative effects of anxiety and hypertension and cardiovascular diseases are possible arousal of sympathetic nervous system, elevated inflammatory markers and defect in endothelial function .[66]

PREVALENCE OF DEPRESSION AND ANXIETY IN HYPERTENSION

In a population-based estimation study conducted in sub-Saharan Africa, it demonstrated an association between hypertension and mental disorders and

8.1% and 4.9% were found to have a 12-month anxiety or depressive disorder in hypertensive patients, respectively.(**Grimsrud A et al**).[67]

Scherrer et al,[68] reported that there are common genetic and environmental risk factors underlying hypertension , depressive symptoms and heart disease. They conducted an association study with 6,903 male-male twins from the Vietnam Era Twin Registry and found that, of the total variance in depression, 8% was common to hypertension and heart disease, 7% of the variance in hypertension was common with depressive symptoms and heart disease, and 64% of the variance in heart disease was common with depressive symptoms and hypertension and suggesting that there are common genetic factors that predispose individuals to hypertension and depression

In a review study, **Huapaya, L et al** [69] revealed that many studies indicated that the prevalence of depression is high in 37% in hypertensive patients compared to a prevalence of 4–22% in the general population. In a community based study in Hong Kong, they concluded that hypertension is associated with anxiety but not depression. **Vetere G et al** [70] observed that higher frequency of anxiety symptoms in hypertension than in the control group ($p < 0.001$) .

Wei and Wang [71] found that anxiety symptoms were prevalent in 12% of known hypertensive patients. The occurrence and severity of Anxiety symptoms were associated with the duration of hypertension, female gender

and history of hospitalization in patients with hypertension. **Thombre**[72] and colleagues found that pre pregnancy depression or anxiety symptoms were associated with hypertension during pregnancy.

DEPRESSION AND ANXIETY IN CHRONIC OBSTRUCTIVE PULMONARY DISEASES

Chronic Obstructive Pulmonary Diseases are at an increased risk of developing depression. It could be attributed to genetic vulnerability to mood disorder, the environmental factors and the direct neuropsychiatric consequences of chronic pulmonary diseases.

GENETIC FACTORS

This risk due to genetic vulnerability is validated by twin and adoption studies. The twin studies infer a concordance rate of 50% in monozygotic twins, 10%–25% in dizygotic (Kaplan and Sadock 1988; Kendler et al 2006; Sullivan et al 2000). The risk of an adolescent in turning into chain smoker is directly proportional to the number of each additional copy of an identified allele (DRD2A1) for a subtype of a dopamine receptor and the depressive symptoms are augmenting the effect.(**Audrain-McGovern et al 2004**).[73]

SOCIAL FACTORS

The depression in chronic medical illness leads to loss of functionality with an attributable risk at 34% (**Dunlop et al 2004**).[74] The functional

impairments caused by depression include decline in daily activities, difficulty in performing previous role in family, social and occupational life and inability to follow their interests and hobbies. The social support available to the patients will help them to cope with the stressful conditions due to chronic diseases. Lesser the social support, the more is the patients' vulnerability to depressive symptoms.. (**McCathie et al 2002**)[75]. Loneliness, poor functionality and poor reversibility of FEV_1 contributes to depression. (**van Manen et al 2002**).[76]

NEUROPSYCHIATRIC FACTORS

The concentration of subcortical hyperintensities (SH) in MRI brain is found to be associated with higher proportion in depression.[77] **Videbech 1997** [78] inferred in a meta-analysis that a common odds ratio for subcortical hyper intensities and major depression was 3.2 (95% CI 2.11–4.82). There is strong evidence of an association between subcortical hyperintensities and late-onset depression, as well as between COPD and an increased severity of subcortical hyperintensities (**van Dijk et al 2004**). [79] The accumulation of subcortical hyperintensities would be due to the changes in microvasculature and biochemical alteration by depression and COPD.

The biomarkers of oxidative damage are considerably elevated in depression. A study by **Forlenza and Miller 2006** [80], showed a direct correlation with levels of 8-hydroxy-2′-deoxyguanosine with the severity of

depression and levels of oxidative stress with severity of depression. Depressed mood is the sequelae of recurrent nocturnal hypoxaemia . In both depression and COPD, micro vascular thrombosis are caused by more pronounced platelet activation (**Davi et al 1997**).[81]

Anxiety is more commonly associated with COPD. The common mechanisms underlying the high association of anxiety with Chronic pulmonary obstructive disease include factors related to dyspnoea and smoking.

Dyspnoea is the most distressing symptom in COPD patients. Individuals with COPD experiencing severe dyspnoea are being associated with anxious feelings and they describe anxiety features during disease exacerbations. Furthermore, anger outbursts and frustration are triggering factor for anxiety, which causes breathlessness. Therefore, it is very apparent that the complex association between breathlessness and anxiety contribute to the increased prevalent rate of anxiety symptoms in COPD.[82]

The variables associated with Depression and Anxiety in patients with COPD are severe dyspnea , physical disability, presence of co morbidity , poor quality of life , living alone, percentage of predicted $FEV_1 < 50\%$, long-term oxygen therapy, female gender, current smoking and low social economic status.

PREVALENCE OF DEPRESSION AND ANXIETY IN COPD

In a case control study, **Gehan Elassal et al** [83] found that in a sample of 80 patients, 55% of them have psychiatric illnesses and depression was found to be around 42.5% in COPD patients and anxiety was found to be 22.5% in COPD patients.

Light RW et al [84] found that there was significant correlation between depression and anxiety scores and 42 % of the patients had significant depression, while only 2 % of the patients had significant anxiety.

In a prevalence study of depression and anxiety in COPD patients, **Regvat et al** [85] found that 50% of the patients of COPD study group showed anxiety and/or depression. In a similar study by **D. Janssen et al** [86] , the mean anxiety scores was 7.6 points and mean depression scores was 7.2 points , in a study conducted with 701 patients.

K. Roundy at al [87] stated that depression and anxiety disorders are recognized about 49 % of the patients in COPD in primary care setting. In a Korean study, **Y.Ryu et al** [88] found patients with chronic respiratory diseases have increased association for depression and anxiety particularly in those having decreased lung function with airflow limitations. The incidence of anxiety and depression symptoms is higher in COPD patients with more hospitalizations and age and gender has no significance in depression.[89]

In another study, depression and anxiety were more frequent in patients with chronic bronchitis than those without chronic bronchitis and in female gender and those having co morbidities. [90] In stable COPD, the prevalence of clinical depression ranges between 10% and 42%, while that of anxiety ranges between 10% and 19%.[91] Depression occurs in 7 to 42% of patients with COPD, and a strong association was found between COPD and depression which was evident from four controlled studies and three of six non-controlled studies and it also revealed the prevalence of depression was high in COPD compared with general population. [92]

Multiple studies have found increased prevalence of depression in patients with COPD than in control subjects. **Yellowlees** [93] found that 34% had an anxiety disorder and 16% had depression in a study with 50 inpatient COPD patients**. Dowson et al** [94] found anxiety in 50% and depression in 28% of 72 patients with COPD hospitalized for rehabilitation services.

AIMS AND OBJECTIVES

AIMS AND OBJECTIVES

1) To estimate the prevalence of Depression and Anxiety in Type 2 Diabetes Mellitus, Systemic Hypertension and Chronic Obstructive Lung Disease.

2) To understand Socio demographic characteristics of the patients with DM, COPD, SHT and anxiety and depression.

3) To evaluate the difference between the presentation of anxiety and depression in the study groups.

4) To compare the prevalence of depression and anxiety among patients of DM, SHT and COPD .

MATERIALS AND METHODS

MATERIALS AND METHODS

STUDY DESIGN

Cross sectional study with internal comparison

STUDY SETTING

The study was conducted at the Diabetology / Hypertension / Chest diseases Out patient department at Government Stanley Medical College Hospital, Chennai. It is a tertiary care teaching institute where patients come from northern part of Chennai, Tiruvallur District and from southern districts of Andhra Pradesh.

STUDY PERIOD

6 Months

STUDY POPULATION

The study population includes patients attending out - patients department of Department of Diabetology / Systemic Hypertension OPD / Department of TB & Chest diseases.

SUBJECTS OF STUDY

Group I

Diabetic patients who have been diagnosed and registered in Department of Diabetology.

Group II

Patients who have been diagnosed as Hypertensive and registered in Systemic Hypertension OPD

Group III

Patients who have been diagnosed as Chronic Obstructive Pulmonary Disease (COPD) and registered in Department of TB and Chest Diseases.

INCLUSION CRITERIA

1. Patients diagnosed as Diabetes mellitus / Systemic Hypertension / COPD and registered in the respective departments.
2. Age > 30 years and < 50 years
3. Patients of both genders with duration of illness (DM / SHT / COPD) more than 5 years
4. Informed consent
5. Patients on regular follow-up

EXCLUSION CRITERIA

1. Presence of any other associated Co-morbid chronic physical disorders with the primary illness..

2. Past or present history of any mental illness.

3. Family History of any psychiatric illness

4. Age Below 30 years or above 50 years

5. History of substance abuse

SAMPLING

For each group, consecutive cases from respective department OPD who satisfied Inclusion criteria were taken.

VARIABLES STUDIED

Socio economic Variables- Age, Sex, Religion, Family, Domicile, Marital status, Education, Occupation, Income And Socio economic status Clinical Variables - Duration of chronic physical illness, Complication of the illness, number of hospitalization, medication adherence, depression and anxiety symptoms.

STUDY PROCEDURE

1. After obtaining informed consent from patients with DM / SHT / COPD attending the respective speciality OPD, they will be interviewed and assessed using various scales. Data will be recorded for this purpose.

2. Information is obtained from patient, reliable informant, and from medical records.

3. Socio – demographic and medical details will be obtained using a semi structured questionnaire designed for this study.

MATERIALS FOR THE ASSESSMENT

1. Socio – demographic pro- forma sheet designed for this study.

2. Beck depression inventory (BDI).

3. Hamilton rating scale for Anxiety (HAM-A).

4. Morisky Medication Adherence Scale : MMAS-8

BECK DEPRESSION INVENTORY (BDI).

BDI[95] is the one of the most important self - report rating scale which is a gold standard tool to assess the depression severity. BDI was developed by Beck *et al,* at 1961, and his original and an old BDI consists of 21 items,

which concern about various symptoms with varying degrees of severity and rated the scores as 0 – 3. BDI[96] – II edition was released after the introduction of DSM – IV , which included some new items and excluded some items present in the previous scale, and make it more reflective towards DSM – IV. BDI – II consists of 21 items, with a total score ranges of 0 – 84. Scores of 0 - 10 considered as normal mood swings of ups and downs; considered as normal, the according to the scores, classified as mild to extreme depression. BDI was used in various studies because of its high reliability and consistent validity, and also the internal consistency of this scale is higher. Since this scale is having the advantage of time consumption, patient self reporting model, and the easy scoring of the severity make it a gold standard tool to assess the severity of depression.

THE HAMILTON RATING SCALE FOR ANXIETY[97] (HAM-A):

This rating scale is administered by the clinician, and it is basically a semi – structured type to evaluate the anxiety symptoms. This scale evaluates symptoms alone and not for any specific disorders. It is one of the rating scale developed first to assess the severity of the symptoms. Still, it is used for clinical studies and for research purposes, because of it's high reliability as well as it's high validity. It also yields a high consistency. This scale is also used in the drug trials for the quantifying the outcome, in Generalized anxiety disorder.

This scale consists of fourteen entities, each of the entity is graded as 0 to 4 (not present to severe), higher the scores more severe in the anxiety symptoms. The total score is ranges from 0 – 56, and the scores < 17 indicates mild severity, scores between 18 and 24 indicates mild to moderate severity, scores between 25 and 30 indicates moderate to severe anxiety symptoms, and the total scores more than 30 indicates very severe.

HAM – A scale is a simple scale easy to administer within 20 to 30 minutes. It is useful to monitor the improvement after initiation of drug treatment. This scale was translated in various languages, because of it's acceptable inter – rater reliability

MORISKY MEDICATION ADHERENCE SCALES: MMAS-8[98]

This self-reported medication adherence scale was originally developed by Prof.Morisky. This MMAS-8 was developed from a previously validated MMAS-4 scale. It was supplemented with additional items considering the circumstances surrounding adherence behavior. Each item is measuring a specific medication-taking behavior and not a determinant of adherence behavior.

OBSERVATION AND RESULTS

OBSERVATION AND RESULTS

Socio-demographic characteristics

The survey data were analysed to find out the age, sex, religion, family type, residence, marital status, education, occupation, income and socio-economic status of the participants across three groups.

The mean age of the participants (N=180) is 41.31 with a standard deviation of 5.19. Individual mean scores across patients of DM, SHT and COPD are presented in figure 1.

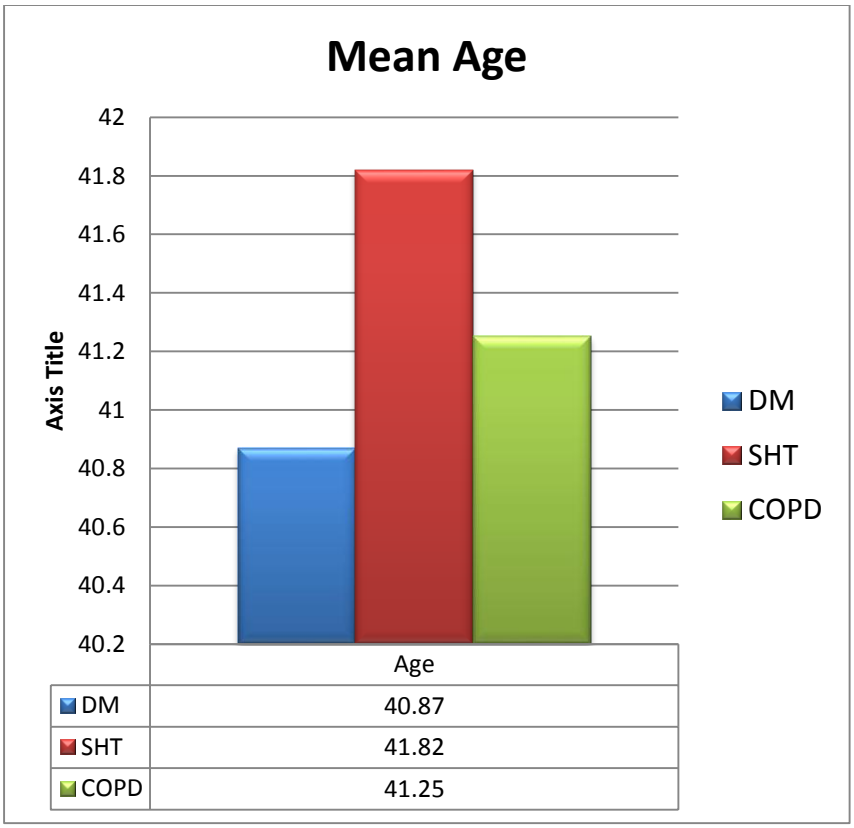

Figure 1: Individual mean age in different study groups.

Sex distribution across DM, SHT and COPD

Figure 2 depicts the distribution of males and females across DM, SHT and COPD. The males and females are equally distributed in DM and SHT groups whereas males predominate the COPD group.

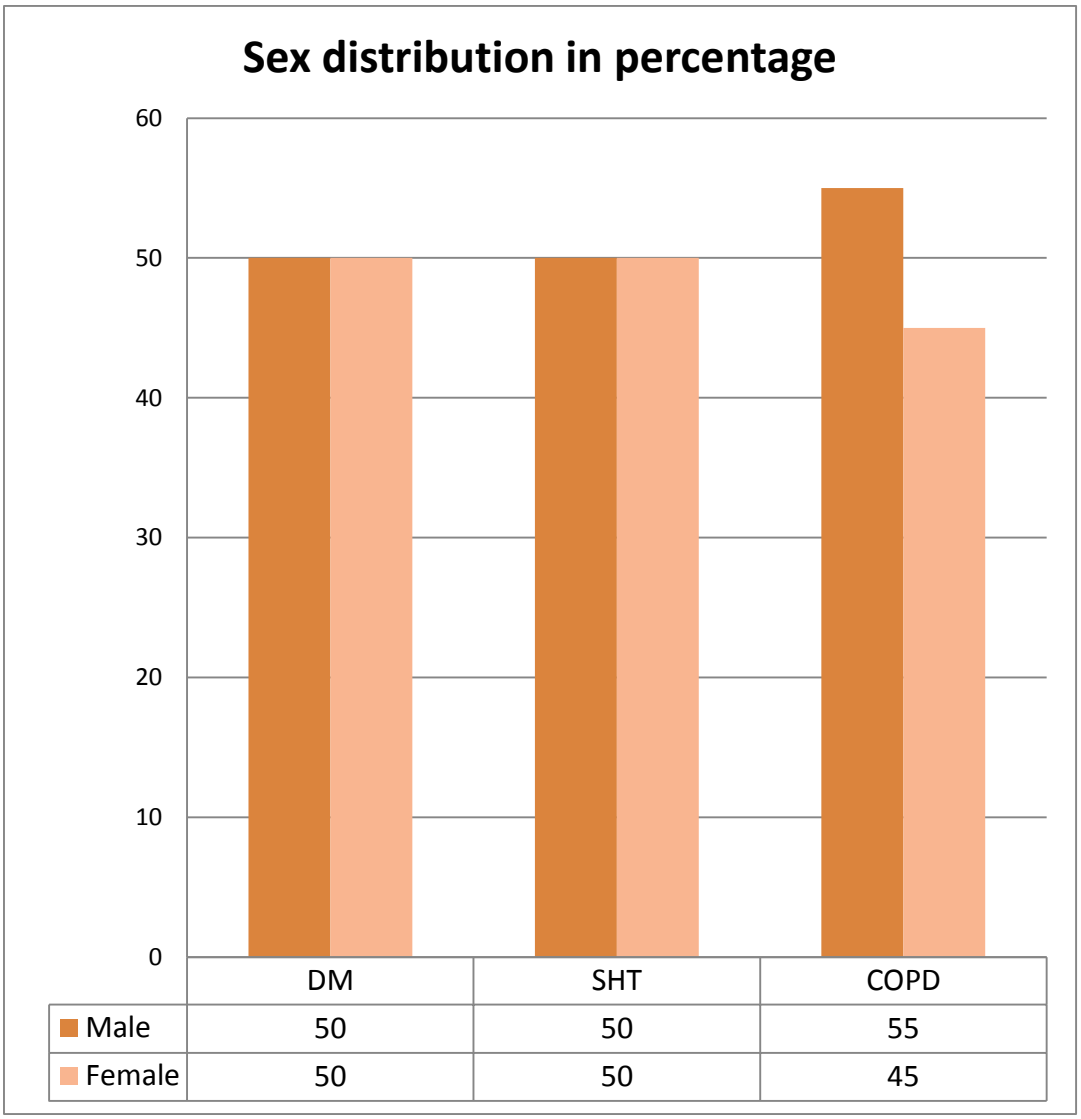

Figure 2: Sex distribution across DM, SHT and COPD

Religion

Figure 3 illustrates the frequency distribution of religion among the study participants. Hindus were more in number.

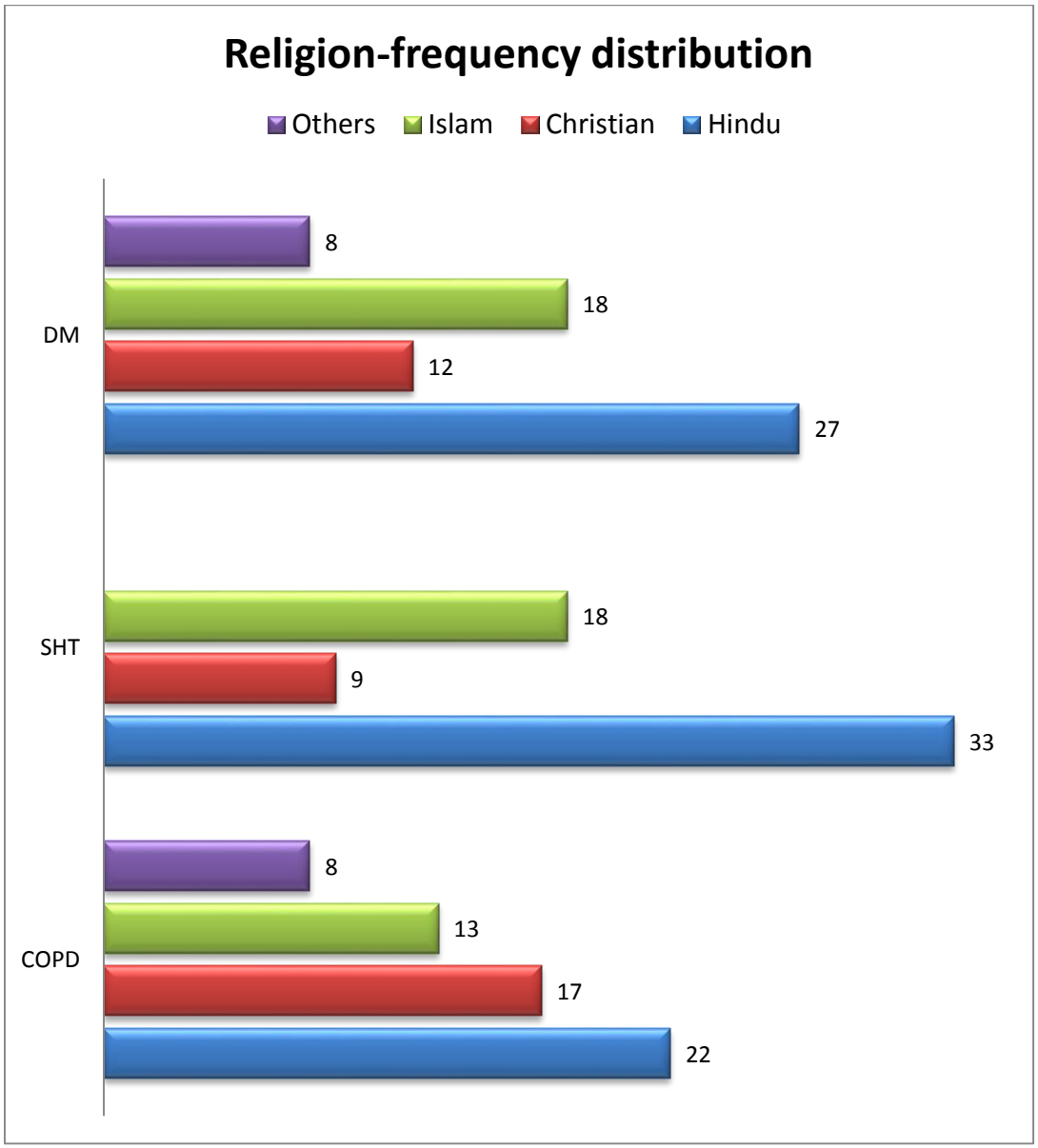

Figure 3: Frequency distribution of religion across DM, SHT and COPD

Family type

Most of our study participants come from nuclear families, n=108 [N=180]. Figure 4 shows the distribution of family type across the study groups.

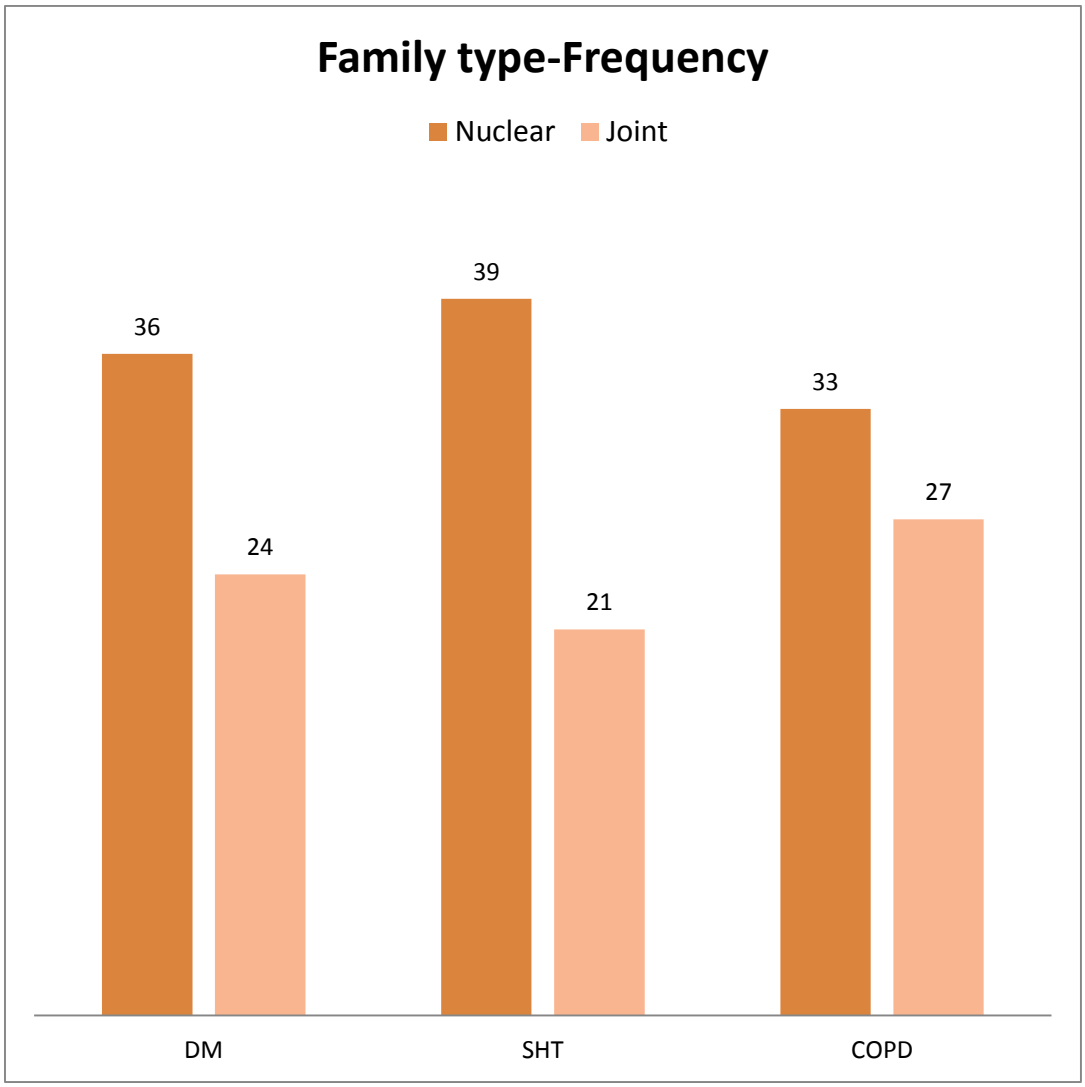

Figure 4: Frequency distribution of family type across DM, SHT and COPD

Domicile

Urban population were more with 68.9% of the entire study population, N=180. Figure 5 demonstrates the residence of the study groups in percentage.

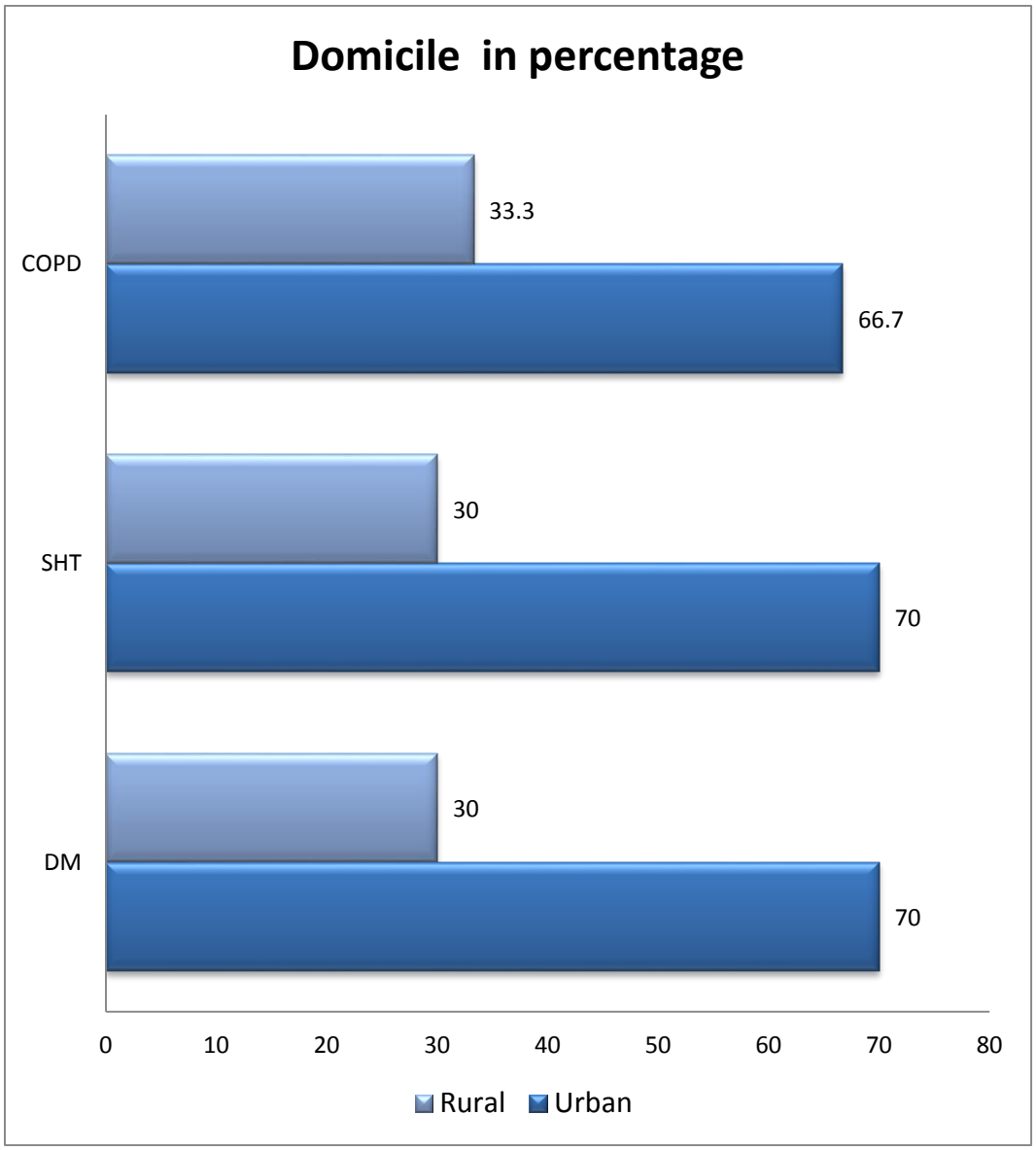

Figure 5: Domicile of study groups

Marital status

The marital status of the participants is given below in figure 6. Most of the participants were married n=156 while only 24 of them were unmarried.

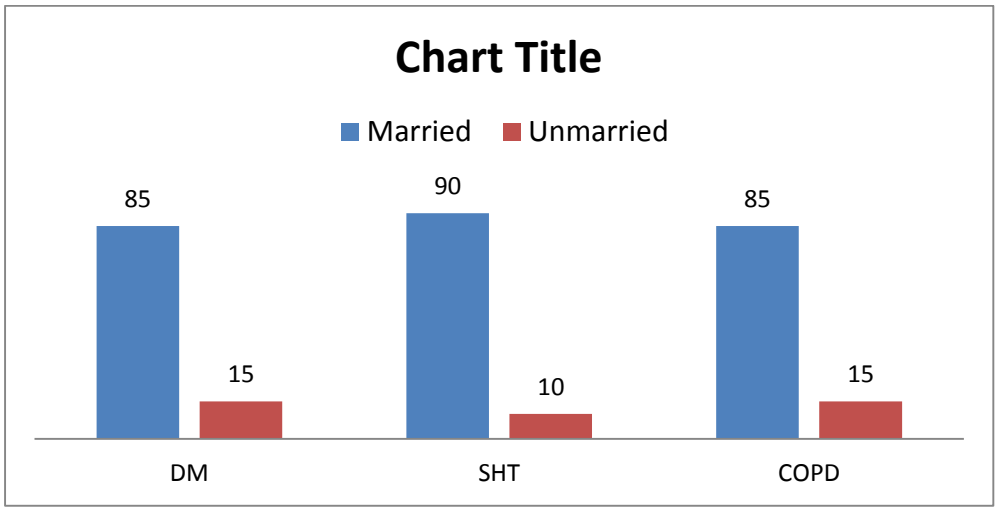

Figure 6: Marital status of the participants

Groups		Frequency	Percent
DM	Married	51	85.0
	Unmarried	9	15.0
	Total	60	100.0
SHT	Married	54	90.0
	Unmarried	6	10.0
	Total	60	100.0
COPD	Married	51	85.0
	Unmarried	9	15.0
	Total	60	100.0

Table 1: Marital status of the participants

Education

Forty-eight participants (26.7%) from the three groups were illiterate with no professionals in any of the groups. A small group of the participants were graduates or post-graduates. Rest of them were almost equally spread between primary school and diploma.

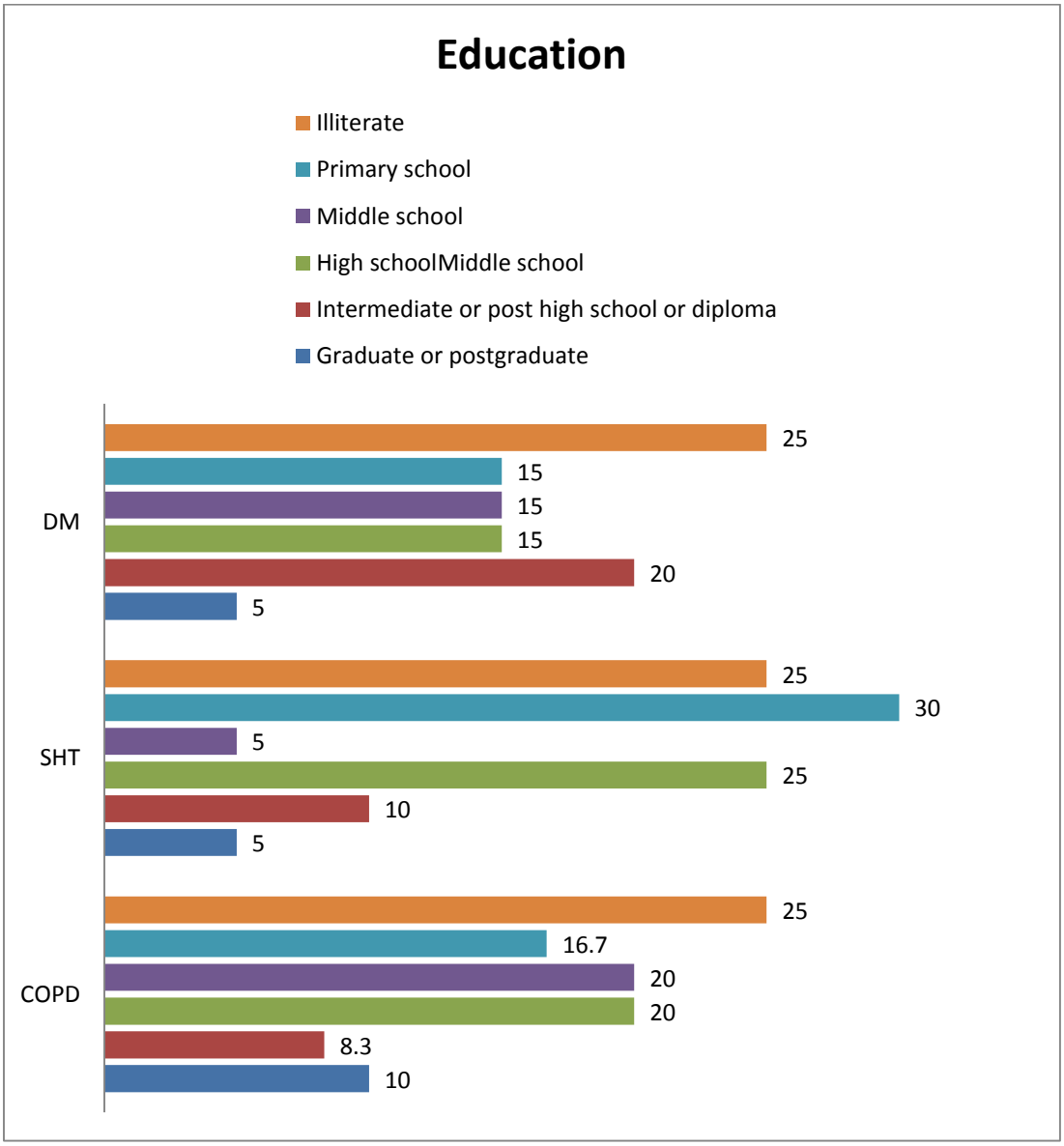

Figure 7: Education of the participants

Study Groups		Frequency	Percent
DM	Graduate or postgraduate	3	5.0
	Intermediate or post high school or diploma	12	20.0
	High school	9	15.0
	Middle school	9	15.0
	Primary school	9	15.0
	Illiterate	18	30.0
	Total	60	100.0
SHT	Graduate or postgraduate	3	5.0
	Intermediate or post high school or diploma	6	10.0
	High school	15	25.0
	Middle school	3	5.0
	Primary school	18	30.0
	Illiterate	15	25.0
	Total	60	100.0
COPD	Graduate or postgraduate	6	10.0
	Intermediate or post high school or diploma	5	8.3
	High school	12	20.0
	Middle school	12	20.0
	Primary school	10	16.7
	Illiterate	15	25.0
	Total	60	100.0

Table.2 shows the Education of the participants

Occupation

The following Figure 8 denotes the percentage of occupation of the study participants of the groups: DM, SHT and COPD. 25.6% (n=46) of the participants were skilled workers and unemployed each across the three categories. Clerical/shop owner or farmer constituted 19.4% of the total study sample.

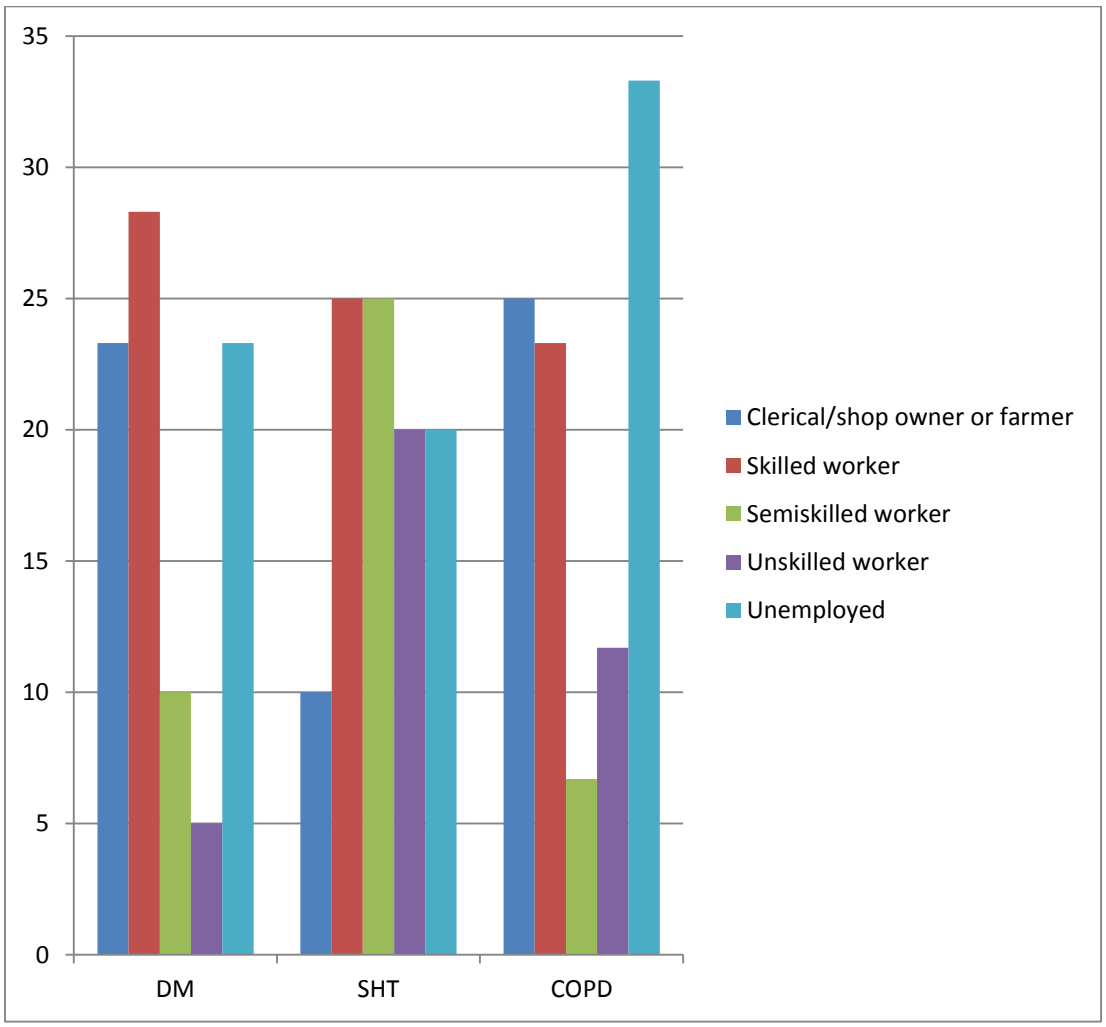

Figure 8: Occupation of the participants

Study groups		Frequency	Percent
DM	Clerical/shop owner or farmer	14	23.3
	Skilled worker	17	28.3
	Semiskilled worker	6	10.0
	Unskilled worker	9	15.0
	Unemployed	14	23.3
	Total	60	100.0
SHT	Clerical/shop owner or farmer	6	10.0
	Skilled worker	15	25.0
	Semiskilled worker	15	25.0
	Unskilled worker	12	20.0
	Unemployed	12	20.0
	Total	60	100.0
COPD	Clerical/shop owner or farmer	15	25.0
	Skilled worker	14	23.3
	Semiskilled worker	4	6.7
	Unskilled worker	7	11.7
	Unemployed	20	33.3
	Total	60	100.0

Table 3: Occupation of the participants

Income

The average income of the participants falls mainly within the salary range of Rs.13,874 – 18,497 (32.3%) and 9,249-13,875 (29.4%) with a small proportion of 7.8% within the salary range of 18,498-36,996. No one is found in the higher income group of Rs.>36,996. Figure 9 shows the salary distribution of the study sample across DM, SHT and COPD.

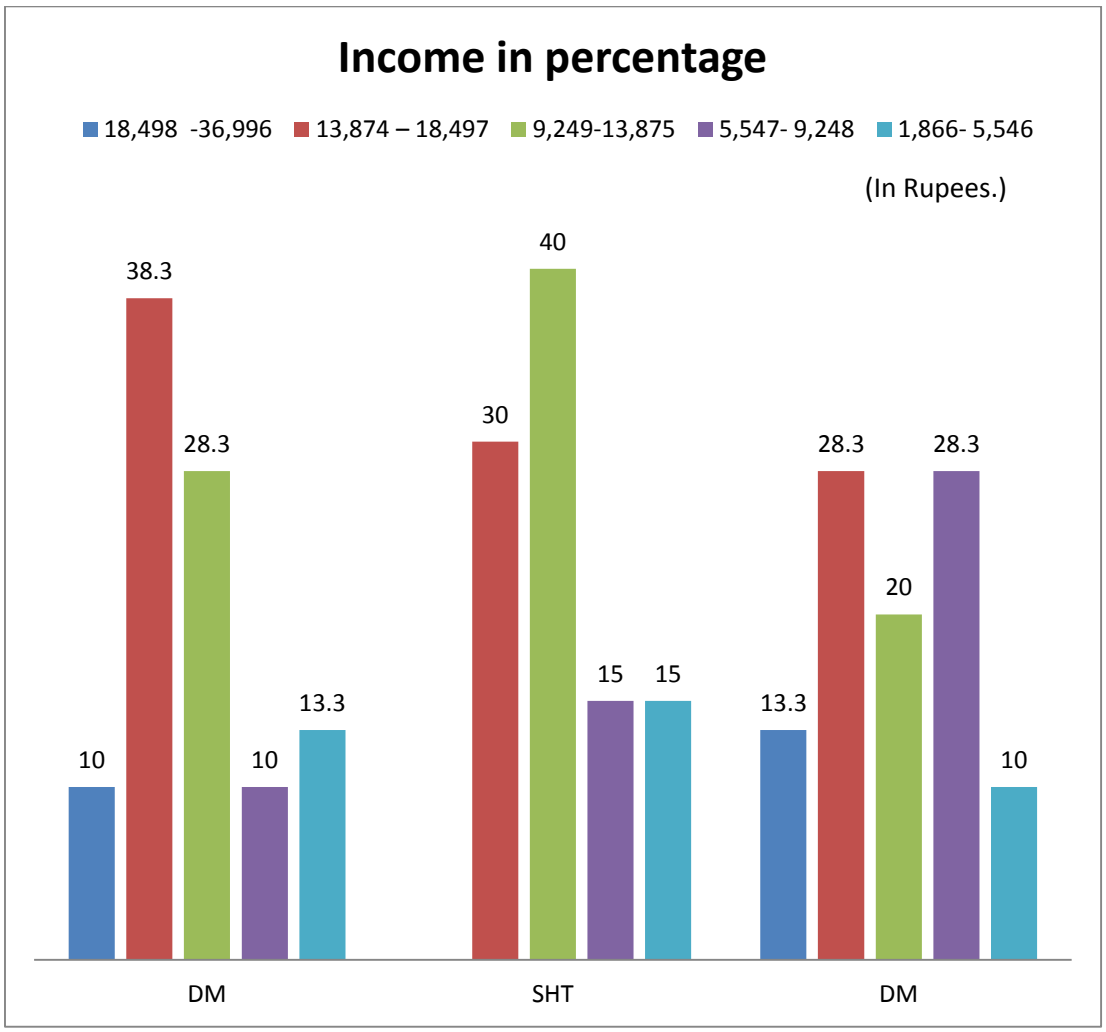

Figure 9: Salary distribution of the study sample

Salary range in rupees		Frequency	Percent
DM	18,498 -36,996	6	10.0
	13,874 – 18,497	23	38.3
	9,249-13,875	17	28.3
	5,547- 9,248	6	10.0
	1,866- 5,546	8	13.3
	Total	60	100.0
SHT	13,874 – 18,497	18	30.0
	9,249-13,875	24	40.0
	5,547- 9,248	9	15.0
	1,866- 5,546	9	15.0
	Total	60	100.0
COPD	18,498 -36,996	8	13.3
	13,874 – 18,497	17	28.3
	9,249-13,875	12	20.0
	5,547- 9,248	17	28.3
	1,866- 5,546	6	10.0
	Total	60	100.0

Table 4: Salary distribution of the study sample

Socio-economic Status

The study population predominantly come from the lower socioeconomic status. The following figure 10 shows the distribution of the participants across various socio-economic groups.

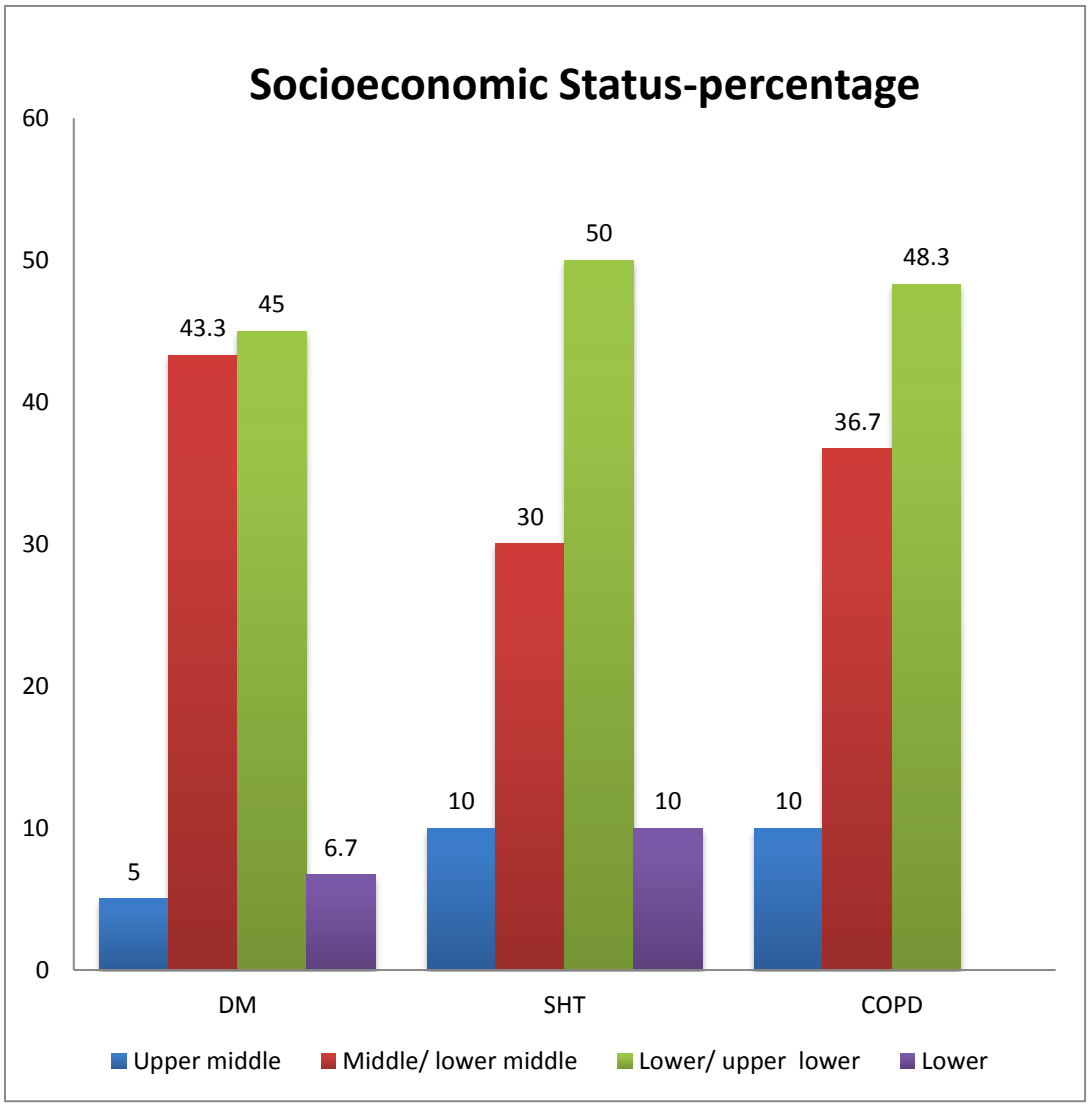

Figure 10 : Socioeconomic status of the study groups

DESCRIPTIVE STATISTICS

Duration of illness

Most of the participants (n=103) have duration of illness between 5-10 years. Few participants (n=18) have duration of illness between 16-20 years. Table 5 shows the duration of illness among the patients of DM, SHT and COPD.

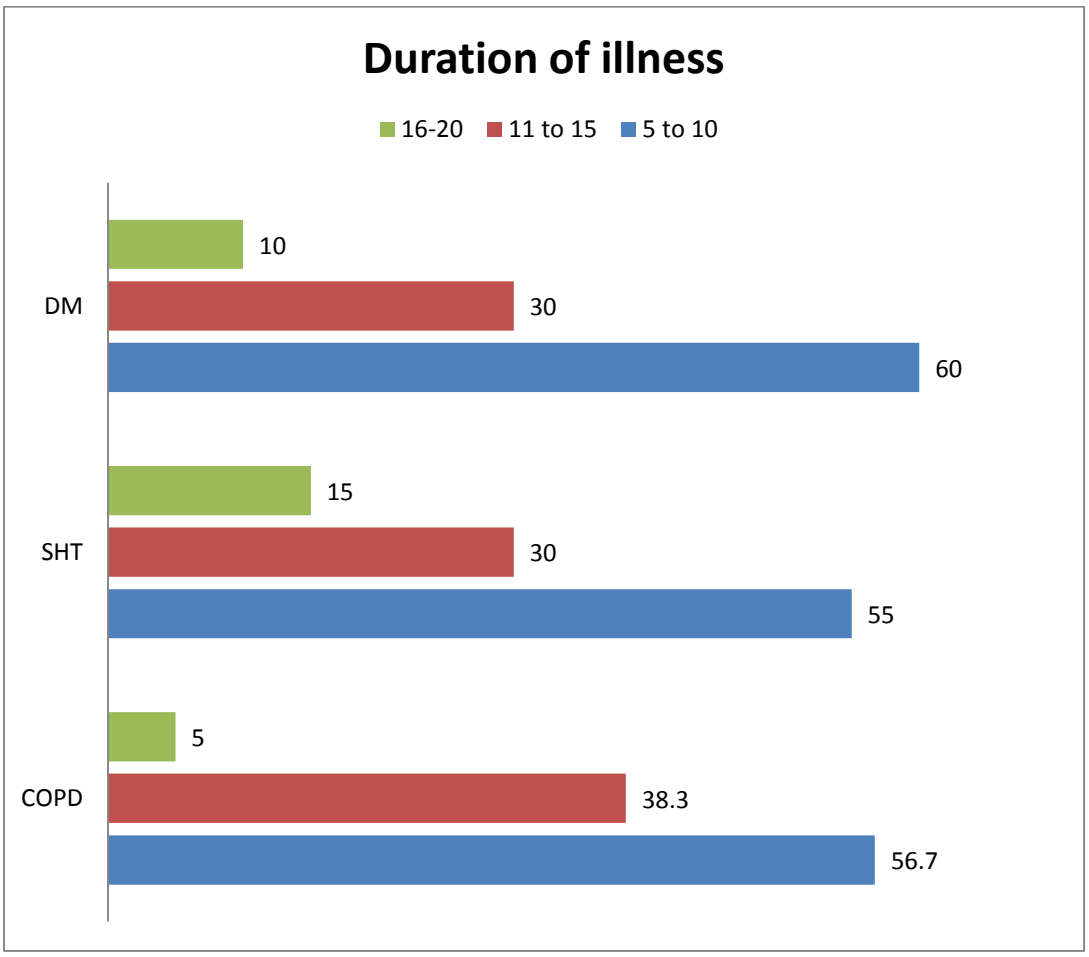

Figure 11: Duration of illness in years

Study groups		Frequency	Percent
DM	5-10	36	60.0
	11-15	18	30.0
	16-20	6	10.0
	Total	60	100.0
SHT	5-10	33	55.0
	11-15	18	30.0
	16-20	9	15.0
	Total	60	100.0
COPD	5-10	34	56.7
	11-15	23	38.3
	16-20	3	5.0
	Total	60	100.0

Table 5: Duration of illness in years

Presence of complications

Figure 12 shows the presence and absence of complications in the various study samples. The presence of complications is more in COPD (51.7%), followed by DM (35%) and SHT (30%).

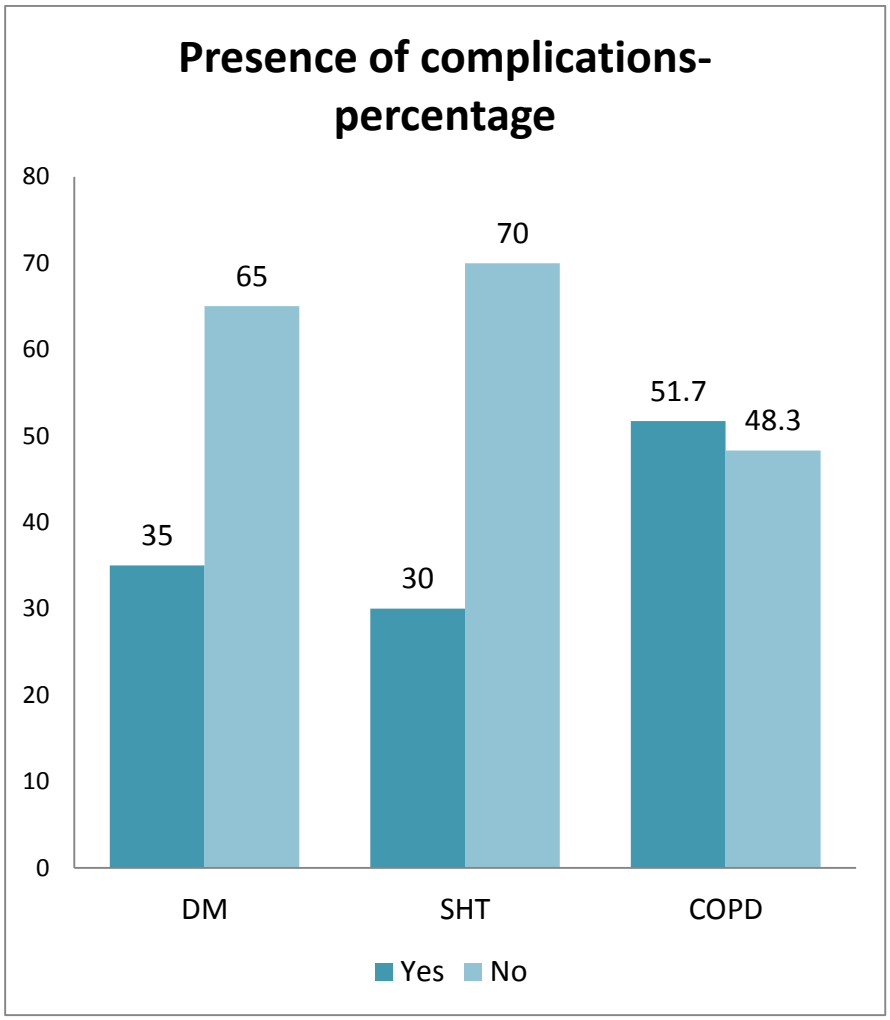

Figure 12 : Presence of complications

Hospitalisations

Figure .13 shows the number of hospitalisations in each group. More patients were hospitalised atleast once during their course of illness in COPD group (66.7%) followed by DM (56.6%) and SHT (33.4%).

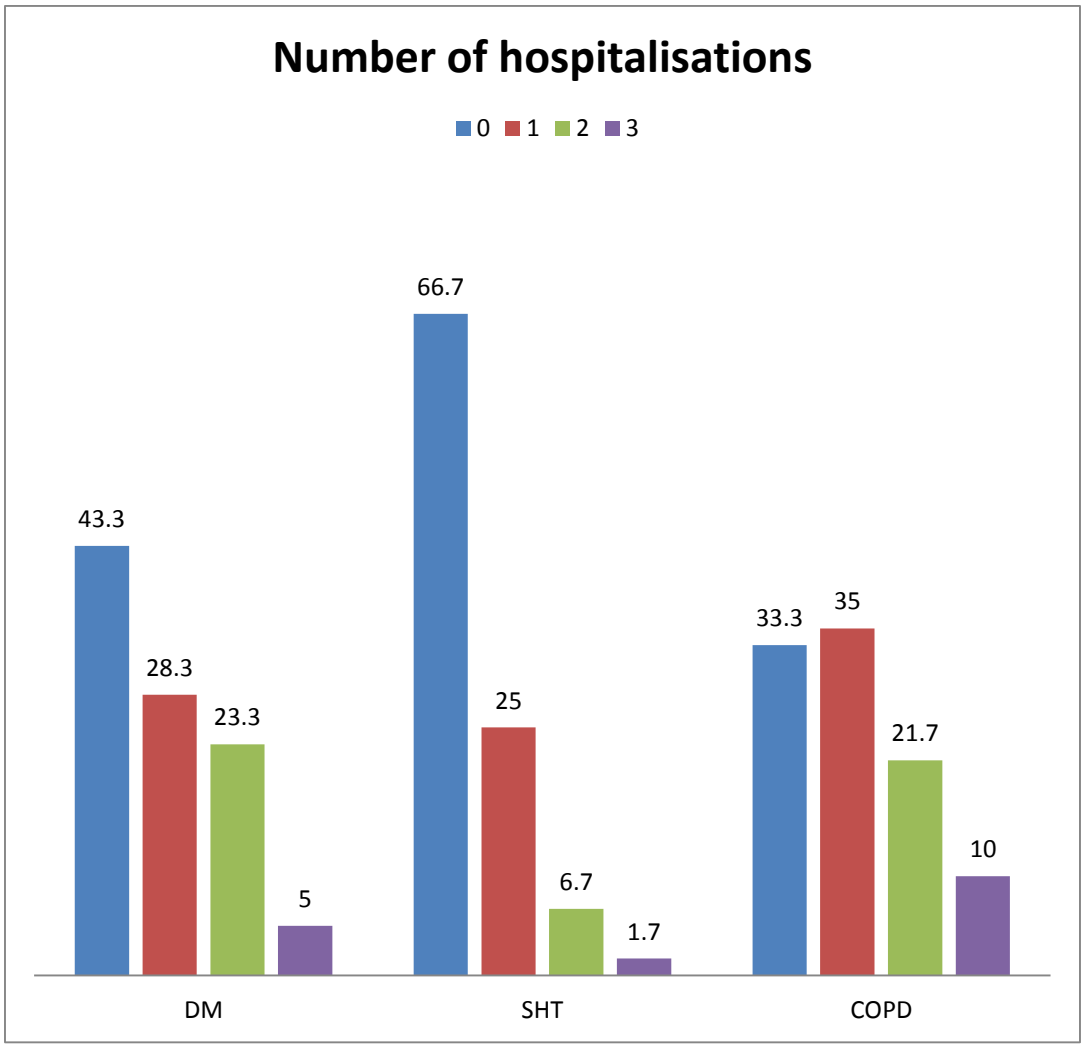

Figure 13: Number of hospitalizations for each group

The following table shows the number of hospitalizations per group during their course of illness. Most of the participants (n=86, 47.8%) were non-hospitalized for their illness.

Study groups		Frequency	Percent
DM	0	26	43.3
	1	17	28.3
	2	14	23.3
	3	3	5.0
	Total	60	100.0
SHT	0	40	66.7
	1	15	25.0
	2	4	6.7
	3	1	1.7
	Total	60	100.0
COPD	0	20	33.3
	1	21	35.0
	2	13	21.7
	3	6	10.0
	Total	60	100.0

Table 6: Number of hospitalisations in each group

Adherence to medication

Most of them (n=81, 45%) have a medium level of adherence to medication. Figure 14 depicts the level of adherence of medication by various study groups.

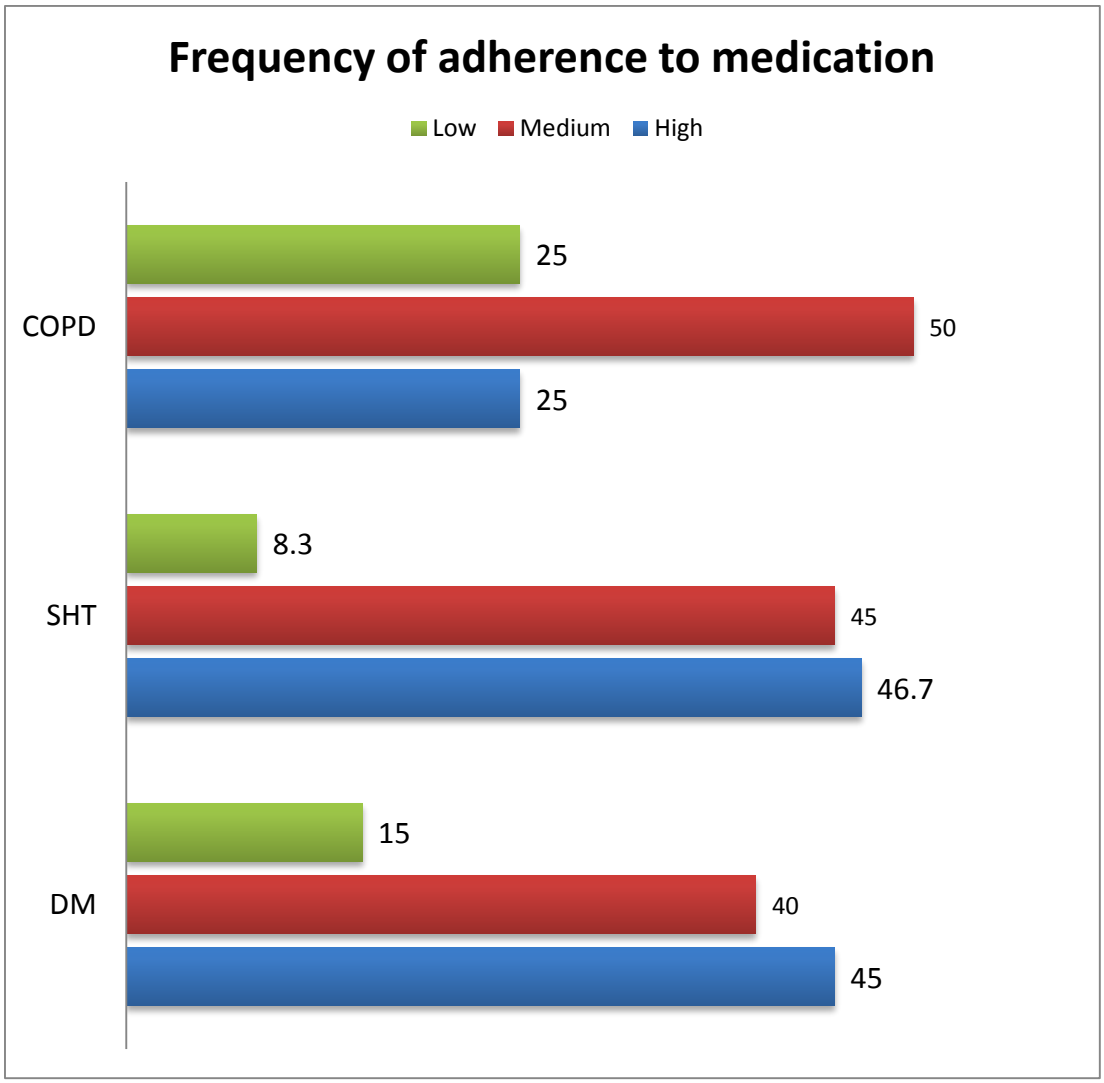

Figure14: Adherence to medication

Prevalence of depression

Figure 15 shows the prevalence of depression among the study participants with 80.6% (n=145) of the total study population being normal, and depression with 19.4 % as mild depression: 6.1% (n=11), moderate depression: 9.4% (n=17) and severe depression : 3.9% (n=7). The prevalence of depressive symptoms is more among COPD group (28.4%) followed by DM (23.3%) and SHT (6.7%)

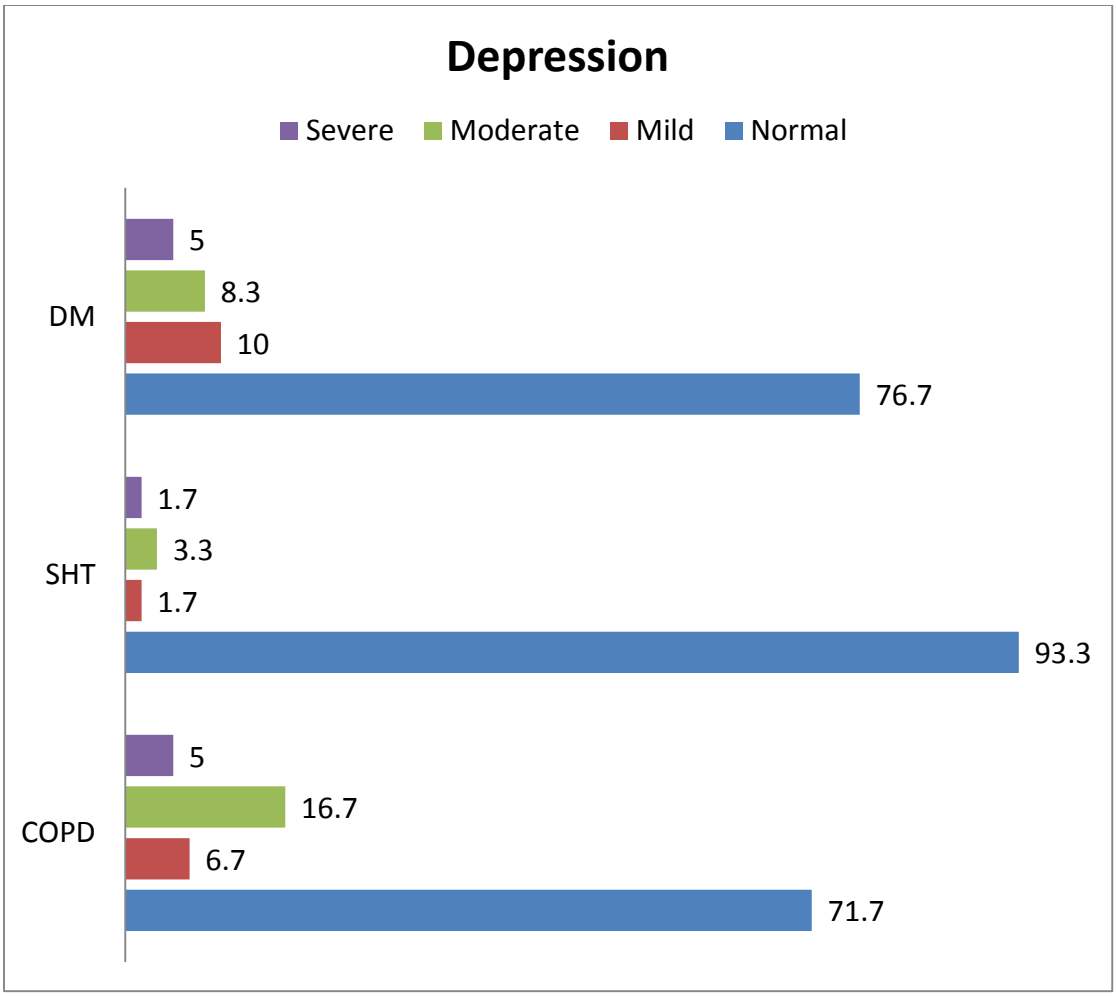

Figure 15: Depression among the study participants

Prevalence of anxiety

Figure 16 shows the prevalence of anxiety among the study participants with 81.1% (n=146) of the total study population being normal, mild to moderate: 8.3% (n=15), moderate to severe : 8.3% (n=15) and very severe anxiety 2.2% (n=4).

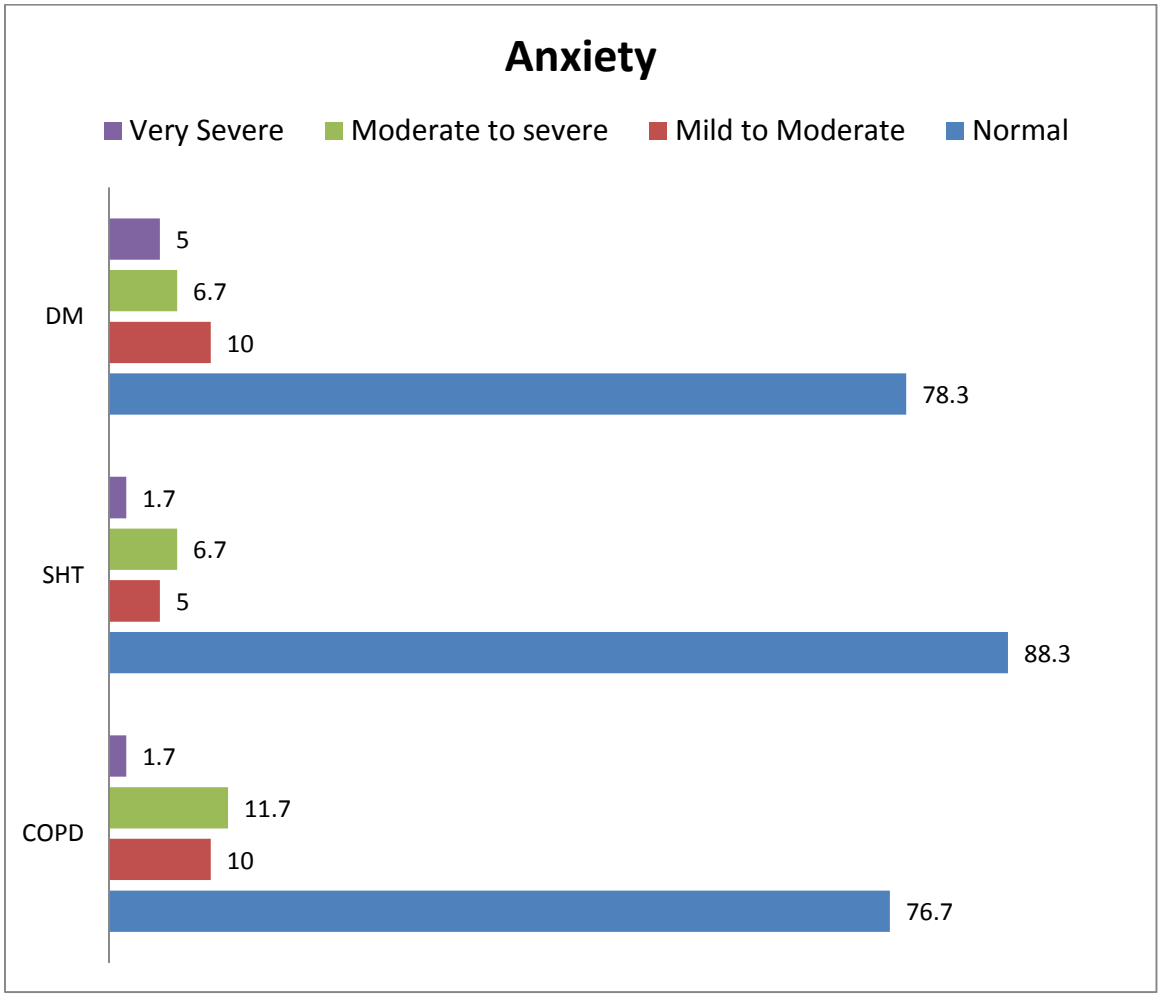

Figure 16: Anxiety among the study participants

	HAMA	Frequency	Percent
DM	Normal	47	78.3
	Mild to moderate	6	10.0
	Moderate to severe	4	6.7
	Very severe	3	5.0
	Total	60	100.0
SHT	Normal	53	88.3
	Mild to moderate	3	5.0
	Moderate to severe	4	6.7
	Total	60	100.0
COPD	Normal	46	76.7
	Mild to moderate	6	10.0
	Moderate to severe	7	11.7
	Very severe	1	1.7
	Total	60	100.0

Table 7: Anxiety among the study participants

INFERENTIAL STATISTICS

Table 8: Relationship between gender and Depression

		BDI				Total	Chi-Square test
		Normal	Mild	Moderate	Severe		
Sex	Male	72	6	14	1	93	**P=0.014**
	Female	73	5	3	6	87	
Total		145	11	17	7	180	

The above table shows that there is a statistically significant relationship between Gender and BDI shown by $p<0.014$.

Table 9 shows the relationship between depression and DM, SHT and COPD.

Table 2: Statistical analysis of relationship between depression and chronic diseases

	BDI				Total
	Normal	Mild	Moderate	Severe	
DM	46	6	5	3	60
SHT	56	1	2	1	60
COPD	43	4	10	3	60
Total	145	11	17	7	180

Depressive symptoms are found more in COPD group(n=17), followed by Diabetes (n= 14) and hypertension has depressive symptoms in only 4 out of 60 subjects.

Table 10: Chi-square test for independence

The following table documents the chi-square test for independence depression and DM, SHT, COPD.

Chi-Square Tests			
	Value	df	P
Pearson Chi-Square	12.279	6	.056
N	180		

Chi-Square test for independence indicated no significant association between depression and DM, SHT, COPD with X2 (6, N=180) = 12.28, p=0.056.

Statistical test to compare depression among the three groups

Table 11 shows the One-way ANOVA test .There is a statistically significant difference between our group means. The significance level is 0.015 (p = .015), which is below 0.05. Therefore, there is a statistically significant difference in the mean BDI scores between the different groups of study.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.433	2	2.717	4.279	**.015**
Within Groups	112.367	177	.635		
Total	117.800	179			

Table 11: One-way ANOVA test to compare depression among three groups

Table 12 shows multiple comparisons, that shows SHT and COPD significantly differ in BDI scores with p=0.013.

Table 5:Multiple Comparisons

Dependent Variable: BDI

Tukey HSD

(I) category	(J) category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
DM	SHT	.283	.145	.129	-.06	.63
	COPD	-.133	.145	.631	-.48	.21
SHT	DM	-.283	.145	.129	-.63	.06
	COPD	-.417*	.145	**.013**	-.76	-.07
COPD	DM	.133	.145	.631	-.21	.48
	SHT	.417*	.145	.013	.07	.76

*. The mean difference is significant at the 0.05 level.

Table 12: Multiple comparisons of BDI scores with DM,SHT and COPD

Statistical test to compare anxiety among the three groups

Table 13 shows the One-way ANOVA test .There is no statistically significant difference between our group means. The significance level is 0.215 (p = .215), which is above 0.05. Therefore, there is no statistically significant difference in the mean anxiety scores between the different groups of study.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.600	2	.800	1.550	**.215**
Within Groups	91.350	177	.516		
Total	92.950	179			

Table 13: One-way ANOVA test to compare anxiety among three groups

Table 14 shows multiple comparisons, no significant difference in HAMA scores between groups is noted

Table 7 :**Multiple Comparisons**

Dependent Variable: HAM-A

Tukey HSD

(I) category	(J) category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
DM	SHT	.200	.131	.282	-.11	.51
	COPD	.000	.131	1.000	-.31	.31
SHT	DM	-.200	.131	.282	-.51	.11
	COPD	-.200	.131	.282	-.51	.11
COPD	DM	.000	.131	1.000	-.31	.31
	SHT	.200	.131	.282	-.11	.51

Table 14: multiple comparisons of HAMA scores with DM, SHT and COPD

Table 15 depicts the comparison of depression and duration of illness between the study groups

			Duration			Total
			5-10	11-15	16-20	
DM	BDI	Normal	31	15	0	46
		Mild	1	2	3	6
		Moderate	1	1	3	5
		Severe	3	0	0	3
	Total		34	36	18	6
SHT	BDI	Normal	32	15	9	56
		Mild	0	1	0	1
		Moderate	0	2	0	2
		Severe	1	0	0	1
	Total		33	18	9	60
COPD	BDI	Normal	29	14	0	43
		Mild	0	4	0	4
		Moderate	5	3	2	10
		Severe	0	2	1	3
	Total		34	23	3	60

15 patients have depressive symptoms with duration of illness between 11 – 15 years followed by 11 patients have depressive symptoms with duration of illness between 5 – 10 years and only 9 patients have depressive symptoms with duration of their illness between 16 -20 years.

Table. 16 illustrates comparison of depression and hospital stay between the study groups

			Duration of hospital stay				Total
			0	1	2	3	
DM	BDI	Normal	26	13	5	2	46
		Mild	0	2	3	1	6
		Moderate	0	2	3	0	5
		Severe	0	0	3	0	3
	Total		26	17	14	3	60
SHT	BDI	Normal	37	14	4	1	56
		Mild	1	0	0	0	1
		Moderate	2	0	0	0	2
		Severe	0	1	0	0	1
	Total		40	15	4	1	60
COPD	BDI	Normal	20	15	7	1	43
		Mild	0	3	0	1	4
		Moderate	0	1	6	3	10
		Severe	0	2	0	1	3
	Total		20	21	13	6	60

11 patients (n=11 ,N=180) having prior hospitalizations once and 15 patients (n=15, N=180) having prior hospitalizations twice have depressive symptoms. Only one patient with severe depression and COPD has had 3 hospital stays. 3 patients without any hospital stays have depressive symptoms.

Table 17 shows the comparison of depression and adherence to medication between the study groups.

			Adherence			Total
			low	medium	high	
DM	BDI	Normal	25	16	5	46
		Mild	1	4	1	6
		Moderate	1	4	0	5
		Severe	0	0	3	3
	Total		27	24	9	60
SHT	BDI	Normal	28	25	3	56
		Mild	0	0	1	1
		Moderate	0	1	1	2
		Severe	0	1	0	1
	Total		28	27	5	60
COPD	BDI	Normal	15	21	7	43
		Mild	0	4	0	4
		Moderate	0	3	7	10
		Severe	0	2	1	3
	Total		15	30	15	60

Table 17: Comparison of depression and adherence to medication between the study groups. High adherence to medication is very low in SHT compared to the other groups under study.

Table 18: Comparison of depression and presence of complications between the study groups

			Complications		Total
			Yes	No	
DM	BDI	Normal	11	35	46
		Mild	3	3	6
		Moderate	4	1	5
		Severe	3	0	3
	Total		21	39	60
SHT	BDI	Normal	17	39	56
		Mild	0	1	1
		Moderate	0	2	2
		Severe	1	0	1
	Total		18	42	60
COPD	BDI	Normal	14	29	43
		Mild	4	0	4
		Moderate	10	0	10
		Severe	3	0	3
	Total		31	29	60

Out of 70 patients(n=70, N=180)having complications due to their illnesses, 10 patients from DM, one from SHT and 17 patients from COPD have depressive symptoms. Out of 110 patients having no complications, 7 patients have depressive symptoms .

Table 19 depicts the comparison of anxiety and duration of illness between the study groups.

			Duration			Total
			5-10	11-15	16-20	
DM	HAM-A	Normal	32	9	6	47
		Mild to moderate	3	3	0	6
		Moderate to severe	1	3	0	4
		Very severe	0	3	0	3
	Total		36	18	6	60
SHT	HAM-A	Normal	32	15	6	53
		Mild to moderate	0	1	2	3
		Moderate to severe	1	2	1	4
	Total		33	18	9	60
COPD	HAM-A	Normal	28	15	3	46
		Mild to moderate	3	3	0	6
		Moderate to severe	3	4	0	7
		Very severe	0	1	0	1
	Total		34	23	3	60

3 patients from SHT group having more than 15 years of their duration of illness have anxiety symptoms.

Table 20 depicts the comparison of anxiety and presence of complications between the study groups

			Complications		
			Yes	No	Total
DM	HAM-A	Normal	10	37	47
		Mild to moderate	4	2	6
		Moderate to severe	4	0	4
		Very severe	3	0	3
	Total		21	39	60
SHT	HAM-A	Normal	11	42	53
		Mild to moderate	3	0	3
		Moderate to severe	4	0	4
	Total		18	42	60
COPD	HAM-A	Normal	17	29	46
		Mild to moderate	6	0	6
		Moderate to severe	7	0	7
		Very severe	1	0	1
	Total		31	29	60

Out of 70 patients (n=70 , N=180) having complications, 32 patients have anxiety symptoms and out of 110 patients having no complications, 2 patients from DM group have anxiety symptoms.

Table 21 depicts the comparison of anxiety and Number of hospital stay between the study groups

			Number of hospital stay				Total
			0	1	2	3	
DM	HAM-A	Normal	25	14	7	1	47
		Mild to moderate	1	3	2	0	6
		Moderate to severe	0	0	3	1	4
		Very severe	0	0	2	1	3
	Total		26	17	14	3	60
SHT	HAM-A	Normal	40	10	3	0	53
		Mild to moderate	0	2	1	0	3
		Moderate to severe	0	3	0	1	4
	Total		40	15	4	1	60
COPD	HAM-A	Normal	20	15	6	5	46
		Mild to moderate	0	6	0	0	6
		Moderate to severe	0	0	6	1	7
		Very severe	0	0	1	0	1
	Total		20	21	13	6	60

14 patients having prior hospitalizations once , 15 patients having prior hospitalizations twice and 4 having thrice have anxiety.

Table 22 depicts the comparison of anxiety and adherence to medication between the study groups

			Adherence			Total
			Low	Medium	High	
DM	HAM-A	Normal	27	20	0	47
		Mild to moderate	0	1	5	6
		Moderate to severe	0	3	1	4
		Very severe	0	0	3	3
	Total		27	24	9	60
SHT	HAM-A	Normal	28	23	2	53
		Mild to moderate	0	1	2	3
		Moderate to severe	0	3	1	4
	Total		28	27	5	60
COPD	HAM-A	Normal	15	19	12	46
		Mild to moderate	0	6	0	6
		Moderate to severe	0	4	3	7
		Very severe	0	1	0	1
	Total		15	30	15	60

Only 29 patients (n=29, N=180) from study group have high adherence to their medication.

DISCUSSION

DISCUSSION

The current study on the patients of chronic illnesses like diabetes mellitus, systemic hypertension and chronic obstructive lung disease to estimate the prevalence of Depression and Anxiety in Type 2 Diabetes Mellitus, Systemic Hypertension and Chronic Obstructive Lung Disease and to compare the patients of DM, SHT and COPD on depression and anxiety throws light on few significant facts.

In our study the prevalence of depressive symptoms among diabetic population is 23.3% with 21 males of the study showing depression against 14 females. The chi-square test shows a significant association with $p<0.14$. This study substantiates with the finding of Poongothai S *et al*, and her colleagues at 2009; found that, the overall prevalence of depression was 15.1%, among this, the prevalence of depression was higher in females (16.3%) than in males (13.9%).

Prevalence of depression among DM is widely studied and Table 9 and Figure 15 show the prevalence of depression among the DM is n=14 with 5% of the DM cases reporting severe depression. This correlates with the study of Biglan*et al*, Connell[36] *et al*, Geringer[37] *et al*, Marcus[38]*et al*, and Nalibott[39] *et al* that reported a higher prevalence of depression in DM. Previous studies show that depression in diabetes is persistent and/or recurrent. In longitudinal and follow up studies, the rates of depression

persistence or recurrence have been reported to range widely, between 11.6 % and 92 %, depending on sample sizes, depression diagnostic criteria and depression classification. Since our study is a cross sectional study, our frontiers of exploration on the persistence of these symptoms is minimal.

This relationship between depression and DM is established in our study but the direction of relationship could not be explained due to the smaller sample size and limited focus of the study. Another lines of research that could not be exploited are the absence of controls. Further is DM the sole factor responsible for depression or is it a mediator or moderator is another area that could not be assessed in this study.

The current study also posits a possible relationship between DM and anxiety with 13 cases showing varying degrees of anxiety. Table 7 shows that 21.7% of DM group had anxiety and out of them 5% of the cases had severe anxiety. A multivariate analysis of a similar type of study at Malaysia, Kurubaran Ganasegeran*et al*, 2014, demonstrated the factors connected with depression and anxiety among type 2 diabetic patients: the age of onset, ethnicity, monthly income and the complications associated with diabetes were significantly influenced the causation of both depression and anxiety among the type 2 diabetic patients.

Our study shows a higher prevalence of depression with 17 of the 60 participants with COPD showing varing degrees of depression with 3 of them manifesting severe depression. Previous studies on prevalence of depression

in patients with chronic obstructive lung disease showed a varied prevalence (7 to 42%). Another study of literature showed a similar claim (van Ede, L, Yzermans, CJ, Brouwer, HJ).

The prevalence of anxiety in COPD patients (23.4%) is higher among all the three groups, shown in Fig. 16 and this finding is in tandem with similar studies : Gehan et al found 22.5% patients of COPD had anxiety, Yellowlees found That 34 % had anxiety disorder.

The prevalence of anxiety among DM is also high as shown in the study which is in support of Barker*et al*, 2008 and Grisby*et al*, 2001 who showed a similar result. Harmanns *et al*, 2005, found that, 19.3% of the diabetic patients had anxiety symptoms and 5.9% of them were fulfilling the criteria of anxiety disorders. The current study had all patients fulfilling the criteria.

The existing literature on the relationship of anxiety and depression to systemic hypertension is minimal. The present study shows the prevalence of depression to be 6.7% and anxiety to be 11.7%. Grimsrud A, Myer L, Seedat S, Williams D, Stein DJ showed that 8.1% have anxiety and 4.9% have depression The prevalence of depression and anxiety found in our study is significantly higher than the previous study. This can be attributed to the sampling at the tertiary care center, which usually reports higher prevalence. Further this is lower than another review study of Huapaya, L et al who reported 37% of depression in SHT.

CONCLUSION

CONCLUSION

This cross sectional study yielded significant results that could be compared with the previous studies. Since this is a cross sectional study, methodologically the research is limited. This research throws light on the prevalence of anxiety and depression in DM, SHT and COPD suggesting other avenues of research in multiple angles of thinking.

The inferences from this study can be summarized that there is an increased prevalence of anxiety and depression in patients with DM, SHT and COPD. But owing to the small sample size and limited focus of the study, it cannot establish how far there is a coexistent chronic illnesses and how far they independently and collectively contribute to the psychiatric illnesses. Maybe two chronic illnesses compound the effect on depression and anxiety.

Further the direction of the relationship between these variables could also not be established. The generalizability of the study is also limited due to smaller sample size and the recruitment of the samples from a single urban setting.

Considering the epidemic nature of these chronic illnesses and depression, the problem of these issues are multiple and complex. It is essential to note that the association between these conditions and anxiety-depression is multifaceted and the harmful effects of both are compounded in case of co morbidity. Further the current study do not take into account the co occurrence of two or more chronic illness in patients suffering from anxiety

disorder or depression or both. Community studies show significant increased risks of prevalent and incident depression. Psychosomatic hypotheses are supported by the above finding.

Another important consideration is the increased incidence of diabetes in patients with depression called persistent treatment resistant depression. Our existing literatures do not provide knowledge on all these. Therefore it is mandatory for us to explore these areas of co morbidity in light of these chronic illnesses causing anxiety and depression.

Further studies that needs to be done are; longitudinal study to understand the relationship, duration and course of these chronic illnesses in the light of anxiety and depression. Secondly, it is interesting to study how anxiety disorders lead to these chronic illnesses and also how diabetes proves to be the prime etiology in these diseases. Even intriguing is the presence of anxiety and depression in a person and how these two affect the etiopathogenesis of these chronic illnesses, course, duration outcome and treatment.

The potential implications from this study would help us to formulate treatment protocols and concentrate on the comprehensive care. Our idea of treatment of these diseases in the presence of depression and anxiety would be drastically influenced. This leaves room for the future researchers to explore these areas of association between psychiatric disorders, chronic illnesses, comorbidity, treatment and other factors that has a telling impact on comprehensive care and treatment.

LIMITATIONS

LIMITATIONS OF THE STUDY

1. Only a small number of samples (60 patients from each group) participated in this study.

2. The study was done at a single point of time, which prevents episodic nature of depression and anxiety symptom evaluation .

3. Being a cross sectional study, it was difficult to ascertain whether depression or anxiety which was identified in the groups was cause or effect of the chronic illnesses.

4. This study was conducted in a tertiary care hospital where most of the patients had severe symptoms and hence the findings of this study cannot be generalized.

5. Since this study was done in a single site, the generalisability of the results are limited.

6. The presence of the study among the urban population limits our understanding of the prevalence of depression and anxiety in DM, SHT and COPD among rural population.

RECOMMENDATIONS

RECOMMENDATIONS

More studies are required to find out the strength of the relationship between DM, SHT and COPD to depression and anxiety, their independent association to each other and to the chronic illness.

Future studies should concentrate more on sampling a larger population and develop a new methodological approach to assess the exact prevalence.

Longitudinal studies to find out the course of the illness and their relationship with anxiety and depression should be considered.

An exploratory study to understand various mediators and moderators of anxiety and depression in DM, SHT and COPD should be considered.

ANNEXURES

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நீரிழிவு நோய், உயர் இரத்த அழுத்தம் மற்றும் நாள்பட்ட நுரையீரல் அடைப்பு நோய் போன்ற மருத்துவ நோய்களில் மன அழுத்தம் மற்றும் பதட்ட நோய் போன்ற மன நோய்களின் ஒரு மதிப்பீட்டு ஆய்வு.

தகவல்:

ஆராய்ச்சியின் நோக்கமும், பயன்களும்:

உங்கள் பங்கேற்பு திட்டமிடப்பட்டுள்ள இந்த மருத்துவ ஆராய்ச்சி ஆய்வின் நோக்கம்:

மன அழுத்தம் மற்றும் பதட்ட நோய் இதர மருத்துவ நோய்களில் பொதுவாக காணப்படுகிறது. இந்த மன நோய்கள் நமக்கு உடல் நல குறைபாட்டை உண்டு பண்ணுவதோடல்லாமல் நமது மருத்துவ செலவினங்களையும் அதிகப்படுத்துகிறது. பதட்ட நோய் அதிகப்படியான உளவியல் எதிர்வினைகளை நீரிழிவு நோயாளிகளுக்கு ஏற்படுத்துகிறது. பதட்ட நோய், நீரிழிவு நோயாளிகளின் நோயின் தன்மையை அதிகப்படுத்தி சமூக மற்றும் தொழில்சார் சூழலில் அவர்களது தனிப்பட்ட பங்கினை பழுதாக்குகிறது. . உயர் இரத்த அழுத்தம் மற்றும் நாள்பட்ட நுரையீரல் அடைப்பு நோய் நோய்களை மன அழுத்தம் மற்றும் பதட்ட நோய் மேலும் மோசமாக்குகிறது. மன அழுத்தம் மற்றும் பதட்ட நோய் போன்ற மனநோய்கள் நீரிழிவு நோய், உயர் இரத்த அழுத்தம் மற்றும் நாள்பட்ட நுரையீரல் அடைப்பு நோய் போன்ற மருத்துவ நோய்களில் அதிகரித்து வரும் இனறைய சூழலில் அந்த நோய்களை மதிப்பீடு செய்வது அவசியமாகிறது. இதுவே நம் ஆய்வின் நோக்கம். அவ்வாறு மதிப்பீடு செய்தவதன் மூலம் இதர மருத்துவ நோய்களோடு இந்த மன நோய்களுக்கும் தகுந்த மருத்துவம் செய்து நோயாளிகளின் வாழ்க்கை தரத்தை உயர்த்தலாம்.

ஆய்வு நடைமுறைகள்:

நீரிழிவு நோய் அல்லது உயர் இரத்த அழுத்தம் அல்லது நாள்பட்ட நுரையீரல் அடைப்பு நோய் போன்ற மருத்துவ நோய்களுக்காக அந்தந்த சிறப்பு மருத்துவ பிரிவில் சிகிச்சை பெற்று வரும், 30 முதல் 50 வயதுடையவர்களும், இன்ன பிற மன நோய் மற்றும் போதைப்பழக்கம் இல்லாதவர்களும் இந்த ஆய்வுக்கு தகுதியானவர்கள்.

அந்தரங்கத் தன்மை:

உங்கள் மருத்துவப் பதிவேடுகள் மிகவும் அந்தரங்கமாக வைத்துக் கொள்ளப்படும் மற்றும் இன்ன பிற மருத்துவர்கள்/விஞ்ஞானிகள்/இந்த ஆய்வின் தணிக்கையாளர்கள் அல்லது ஆராய்ச்சி ஆதரவாளர்களின் பிரதிநிதிகள் ஆகியோரிடமும் அவை வெளிப்படுத்தப்படும். இந்த ஆய்வின் முடிவுகள் அறிவியல் பத்திரிக்கைகளில் பிரசுரிக்கப்படலாம். ஆனால் பெயரை வெளியிடுவதன்மூலம் நோயாளிகள் அடையாளம் காட்டப்பட மாட்டார்கள்.

ஆய்வில் உங்கள் பங்கேற்பு மற்றும் உங்கள் உரிமைகள்:

இந்த ஆய்வில் உங்கள் பங்கேற்பு முழுவதும் உங்களுடைய விருப்பத்தைச் சார்ந்தது. இதில் நீங்கள் பங்கேற்க மறுக்கவோ, பாதியில் வெளியேறி விடவோ அல்லது குறிப்பிட்ட கேள்விகளுக்கு விடையளிக்க மறுக்கவோ, உங்களுக்கு முழு உரிமை உண்டு. எப்படி இருந்தாலும் உங்கள் உடல்நிலைக்கேற்ப, உங்களுக்கு பொருத்தமான சிகிச்சை தொடர்ந்து அளிக்கப்படும். தாங்கள் இது குறித்து வேறு விபரங்கள் தெரிந்து கொள்ள விரும்பினால், எங்களிடம் கேட்டுத் தெரிந்துகொள்ளலாம்.

மேலும் விபரங்கள் அறிய கீழ் கண்ட நபரை அணுகவும்:

(தனியாகப் பிரித்தெடுத்து, ஆய்வில் பங்கேற்பவரிடம் தரப்பட வேண்டும்)

PROFORMA

SOCIO DEMOGRAPHIC FACTORS

Name:

1. Age

2. Sex 1. Male 2. Female

3. Religion 1. Hinduism 2. Christianity 3. Islam 4. Others

4. Family distribution 1. Nuclear 2. Joint family

5. Residence 1. Urban 2. Rural

6. Marital status 1. Married 2. Unmarried

7. Education 1. Profession 2. Graduate or post graduate
3. Intermediate or post high school or diploma
4. High school 5. Middle school
6. Primary school 7. Illiterate

8. Occupation 1. Profession 2. semi Profession 3. Clerical/shop owner or farmer 4. Skilled worker 5. Semi skilled worker 6. Unskilled worker 7. Unemployed

9. Income 1. Rs. >36,997 2. Rs. 18,498 -36,996
3. Rs. 13,874 – 18,497 4. Rs. 9,249-13,875
5. Rs.5,547- 9,248 6. Rs. 1,866- 5,546
7. Rs. <1,865

10. Socioeconomic status 1. Upper 2. Upper middle 3. Middle/ lower middle 4. Lower/ upper lower 5. Lower

Clinical factors

11. Duration of illness 1. 5 – 10 yrs 2. 11 – 15 yrs 3. 16- 20 yrs
4. > 20 yrs

12. Complication 1. Yes 2. No

13.Hospital stays

14. Medication adherence 1. High adherence (0) 2. Medium adherence (1 -2) 3. Low adherence (3-8)

15.BDI 1. Normal (0 -9) 2. mild (10-16)
3. moderate (17-29) 4. Severe (30-63)

16. HAMA 1. normal (<17) 2. Mild to moderate (18-24) 3. Moderate to severe (25-30)
4. Very severe (>30).

Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire

1.

0	I do not feel sad.
1	I feel sad
2	I am sad all the time and I can't snap out of it.
3	I am so sad and unhappy that I can't stand it.

2.

0	I am not particularly discouraged about the future.
1	I feel discouraged about the future.
2	I feel I have nothing to look forward to.
3	I feel the future is hopeless and that things cannot improve.

3.

0	I do not feel like a failure.
1	I feel I have failed more than the average person.
2	As I look back on my life, all I can see is a lot of failures.
3	I feel I am a complete failure as a person.

4.

0	I get as much satisfaction out of things as I used to.
1	I don't enjoy things the way I used to.
2	I don't get real satisfaction out of anything anymore.
3	I am dissatisfied or bored with everything.

5.

0	I don't feel particularly guilty
1	I feel guilty a good part of the time.
2	I feel quite guilty most of the time.
3	I feel guilty all of the time.

6.

0	I don't feel I am being punished.
1	I feel I may be punished.
2	I expect to be punished.
3	I feel I am being punished.

7.

0	I don't feel disappointed in myself.
1	I am disappointed in myself.
2	I am disgusted with myself.
3	I hate myself.

8.

0	I don't feel I am any worse than anybody else.
1	I am critical of myself for my weaknesses or mistakes.
2	I blame myself all the time for my faults.
3	I blame myself for everything bad that happens.

9.

0	I don't have any thoughts of killing myself.
1	I have thoughts of killing myself, but I would not carry them out.
2	I would like to kill myself.
3	I would kill myself if I had the chance.

10.

0	I don't cry any more than usual.
1	I cry more now than I used to.
2	I cry all the time now.
3	I used to be able to cry, but now I can't cry even though I want to.

11.

0 I am no more irritated by things than I ever was.
1 I am slightly more irritated now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time.

12.

0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13.

0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions more than I used to.
3 I can't make decisions at all anymore.

14.

0 I don't feel that I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel there are permanent changes in my appearance that make me look unattractive
3 I believe that I look ugly.

15.

0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16.

0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17.

0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.

18.

0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.

19.

0 I haven't lost much weight, if any, lately.
1 I have lost more than five pounds.
2 I have lost more than ten pounds.
3 I have lost more than fifteen pounds.

20.

0 I am no more worried about my health than usual.

1 I am worried about physical problems like aches, pains, upset stomach, or constipation.

2 I am very worried about physical problems and it's hard to think of much else.

3 I am so worried about my physical problems that I cannot think of anything else.

21.

0 I have not noticed any recent change in my interest in sex.

1 I am less interested in sex than I used to be.

2 I have almost no interest in sex.

3 I have lost interest in sex completely.

INTERPRETING THE BECK DEPRESSION INVENTORY

Now that you have completed the questionnaire, add up the score for each of the twenty-one questions by counting the number to the right of each question you marked. The highest possible total for the whole test would be sixty-three. This would mean you circled number three on all twenty-one questions. Since the lowest possible score for each question is zero, the lowest possible score for the test would be zero. This would mean you circles zero on each question. You can evaluate your depression according to the Table below.

Total Score_____Levels of Depression

1-10_____These ups and downs are considered normal
11-16_____ Mild mood disturbance
17-20_____Borderline clinical depression
21-30_____Moderate depression
31-40_____Severe depression
over 40_____Extreme depression

A PERSISTENT SCORE OF 17 OR ABOVE INDICATES THAT YOU MAY NEED MEDICAL TREATMENT. IF YOU HAVE ANY CARDIAC CONCERNS, PLEASE CONTACT CARDIOVASCULAR INTERVENTIONS, P.A. at 407-894-4880

BDI TAMIL VERSION

A.	0	நான் கவலையுடன் இருக்கவில்லை.
	1.	நான் கவலையுடன் இருக்கிறேன்.
	2.	நான் எப்போதும் கவலையுடன் இருக்கிறேன். அதிலிருந்து மீள முடியவில்லை.
	3.	நான் கவலையுடன் இருப்பதை என்னால் தாங்கிக் கொள்ள முடியவில்லை.
B.	0	வருங்காலத்தைப் பற்றி நல்லபடியாக இருக்கமென நினைக்கிறேன்.
	1a.	எதிர் காலத்தைப் பற்றி மிகவும் கவலையாக இருக்கிறேன்.
	2.	நான் எப்போதும் கவலையுடன் இருக்கிறேன். அதிலிருந்து மீள முடியவில்லை.
	3.	நான் கவலையுடன் இருப்பதை என்னால் தாங்கிக் கொள்ள முடியவில்லை.
C.	0	நான் தோல்வியடைந்ததாக உணரவில்லை
	1.	நான் ஒரு சாதாரணமான மனிதனை விட அதிகமாக தோல்வியடைந்துள்ளேன்.
	2a.	நன்மையானவை எனக்கு ஓரளவே கிடைத்துள்ளது.
	3.	நான் முற்றிலும் தோல்வியடைந்த மனிதனாக நினைக்கிறேன் (பெற்றோர், கணவன், மனைவி என்ற முறையில்)
D.	0	நான் குறிப்பிடத் தகுந்த முறையில் திருப்தியற்றவனாக இல்லை
	1a.	பெரும்பாலும் எல்லா நேரங்களிலும் எனக்கு அலுப்பு தட்டியுள்ளது.
	1b.	இதற்கு முன்பு எவ்வாறு சந்தோஷமான அனுபவித்துக் கொண்டிருந்தேனோ அது மாதிரி இப்போது இருக்கமுடியவில்லை.
	2.	எந்த ஒரு பொருளிலோ, நிகழ்ச்சியிலோ நான் திருப்தியடைய முடியவில்லை.
	3.	எல்லாவற்றிலும் திருப்தி இல்லாதவனாக இருக்கிறேன்.
E.	0	நான் உபயோகமில்லாதவனாக உணரவில்லை
	1.	றுபரும்பாலான நேரம் நான் மோம், உதவாக்கரை என்று உணர்கிறேன்.
	2a.	நான் மிகவும் குற்ற உணர்வுடனிருக்கிறேன்.
	2b.	எல்லா நேரத்திலம் யாருக்கும் உபயோகமில்லாத மனிதனாக உணர்கிறேன்.
	3.	நான் மிகவும் கெட்டவனாகவோ அல்லது எதற்கும் உபயோகமில்லாதவனாகவோ உணர்கிறேன்.

F.	0	நான் தண்டிக்கப்படுவதாக நினைக்கவில்லை.
	1.	ஏதேனும் கெடுதுல் செய்யும்படி எனக்கு ஏற்படக்கூடும் என்று உணர்கிறேன்.
	2.	எனக்கு நிச்சயம் தண்டனை கிடைக்கும்
	3a.	நான் தண்டனை பெறத் தகுதியுடையவாக நினைக்கிறேன்.
	3b.	எனக்கு தண்டனை கிடைக்க விரும்புகிறேன்.
G.	0	என்னிடத்ததில் எனக்கு ஏமாற்றமில்லை
	1a.	நான் ஏமாற்றடைந்திருக்கிறேன்.
	1b.	நான் என்னையே விரும்பவில்லை
	2.	நான் என்னையே வெறுக்கிறேன்.
	2b.	நான் என்னைப் பற்றியே நினைக்கிறேன்
H.	0	மற்ற எவரையும் விட நான் மோசமானவன் என்று நினைக்கவில்லை.
	1a.	நான் என்னுடைய தவறுகளுக்காக என்னையே கடுமையாக விமர்ச்சித்துக் கொள்பவன்
	2b.	தவறாக நடக்கும் எல்லா காரியங்களுக்கும் நானே காரணம் என நினைக்கிறேன்.
I.	0	என்னை நானே துன்புறுத்திக் கொள்ள நினைக்கவில்லை
	1.	என்னை நானே துன்புறுத்திக் கொள்ள நினைக்கிறேன். ஆனால் அதை நிறைவேற்றிக் கொள்ளமுடியவில்லை.
	2.	நான் தற்கொலை செய்து கொள்ள வேண்டிய திட்டங்களுடன் இருக்கிறேன்.
	2a.	நான் என்னையே வெறுக்கிறேன்.
	3.	என்னால் முடியுமானால் என்னை நானே கொலை செய்து கொள்வேன்.
J	0	சாதாரணமாக நான் அழுவது கிடையாது
	1.	இதற்கு முன்பு உள்ளதை விட இப்போது அதிகம் அழுகிறேன்.
	2.	இப்போது எல்லா நேரங்களிலும் அழுகிறேன். என்னால் நிறுத்த முடியவில்லை.
	3.	இப்போதெல்லாம் நான் அழவேண்டுமென்று விரும்பினால் கூட அழமுடியவில்லை.
K	0	இப்போது நான் இதற்கு முன்பு உள்ளதை விட எரிச்சல் படுவது கிடையாது.
	1.	இப்போதெல்லாம் எனக்கு எளிதாக எரிச்சல் ஏற்பட்டு விடுகிறது.
	2.	எல்லா வேளைகளிலும் எனக்கு எரிச்சல் உண்டாகிறது.
	3	எனக்கு எரிச்சல் மூட்டக் கூடிய காரியங்கள் நடந்தால் கூட இப்போது எனக்கு எரிச்சல் ஏற்படாமல் போய்விடுகிறது.

L	0	மற்றவர்களிடம் எனக்கு உள்ள ஈடுபாடு ஒன்றும் குறையவில்லை.
	1.	இதற்கு முன்பு இருந்தமாதிரி மற்றவர்களின் மேல் எனக்கு உள்ள ஈடுபாடு சிறிது குறைந்த காணப்படுகிறது.
	2.	மற்றவர்களின் மேல் உள்ள எனது விருப்பம் பெரும்பாலும் குறைந்துள்ளது.
	3.	மற்றவர்களின் மேல் உள்ள எனது விருப்பம் முழுவதுமாகக் குறைந்து அவர்களைப் பற்றிய அக்கறை ஏதும் எனக்கு கிடையாது.
M	0	எப்போதும் போல் ஒரு காரியத்தைப் பற்றி நல்லபடியாகத் தீர்மானிக்க முடிகிறது.
	1.	ஏதாவது காரியங்களில் முடிவு எடுப்பதை நான் நிறுத்தி வைத்துக் கொள்கிறேன். ஏனெனில் என் மீதே எனக்கு நம்பிக்கை இல்லை.
	2.	மற்றவர்கள் உதவி இல்லாமல் எந்த ஒரு காரியத்தை தீர்மானிக்க முடியவில்லை.
	3.	இப்போது எந்தக் காரியத்தைப் பற்றியும் முடிவு எடுக்கவே முடியவில்லை.
N	0	இதற்கு முன்பு இருந்ததை விடப் பார்ப்பதற்கு நான் மோசமாக இல்லை.
	1.	நான் வயதானவரைப் போன்று காட்சியளிப்பதாகவோ, அல்லது கவர்ச்சியற்று காணப்படுவதாகவோ நினைத்து மிகவும் கவலையடைந்துள்ளேன்.
	2.	என்னுடைய உடல் தோற்றத்தில் நிரந்தரமான மாற்றங்கள் ஏற்பட்டு நான் பார்ப்பதற்கு கவர்ச்சியற்றவனாகக் காணப்படுவதாக உணர்கிறேன்.
	3.	நான் அவலட்சணமாக தோற்றமளிப்பதாக உணர்கிறேன்.
O	0	முன்பு காரியங்களைச் செய்ய முடிந்த மாதிரியே இப்போது செய்கிறேன்.
	1a.	ஏதாவது வேலை செய்ய ஆரம்பிக்க அதிகப்படியான முயற்சி தேவைப்படுகிறது.
	1b.	முன்பு வேலை செய்தது போன்று இப்போது வேலை செய்ய முடிவதில்லை.
	2.	ஏதாவது ஒரு வேலையைச் செய்ய என்னை மிகவும் வருத்திக் கொள்ள வேண்டியுள்ளது.
	3.	எந்த வேலையும் என்னால் செய்ய முடிவதில்லை.
P	0	எப்போதும் போல் என்னால் நன்றாக தூக்க முடிகிறது.
	1.	இதற்கு முன்பு உள்ளதை விட இப்போது காலையில் எழுந்திருக்கும் போது மிகவும் களைப்பாக உள்ளது.
	2.	வழக்கத்திற்கு மாறாக ஒன்று அல்லது இரண்டு மணி நேரம் முன்பாக படுக்கையிலிருந்து விழித்துக் கொள்கிறேன். பிறகு நூங்க முடிவதில்லை.
	3.	ஒவ்வொரு நாளும் காலையில் சீக்கிரம் எழுந்து விடுகிறேன். ஐந்து மணி நேரத்திற்கு மேல் தூக்க முடிவதில்லை.

Q	0	சாதாரணமானது அல்லாமல் அதிகமாக எனக்கு களைப்பு என்பது ஏற்படுவதில்லை.
	1.	வழக்கத்திற்கு மாறாக எனக்கு இப்போது அதிகமான களைப்பு ஏற்படுகிறது.
	2.	எந்த ஒரு காரியமும் செய்யும் போது எனக்கு களைப்பு ஏற்படுகிறது.
	3.	எந்த ஒரு காரியமும் செய்வதற்கு மிகுந்த களைப்பு ஏற்படுகிறது.
R	0	எனக்கு வழக்கம் போலவே பசி எடுப்பது மோசமாக இல்லை.
	1.	சாதாரணமாக இருப்பது போல் எனக்கு பசி எடுப்பது அவ்வளவு நன்றாக இல்லை.
	2.	இப்பேது எனக்கு பசி எடுப்பது மிகவும் மோசமாக உள்ளது.
	3.	எனக்கு எப்போதும் பசியே எடுப்பதில்லை.
S	0	சமீப காலத்தில் என்னுடைய உடல் எடையில் குறைவு ஏற்பட்டதில்லை.
	1.	என்னுடைய எடையில் 5 பவுண்டுக்கு மேல் குறைந்துள்ளது.
	2.	என்னுடைய எடையில் 10 பவுண்டுகள் மேல் குறைந்துள்ளது.
	3.	என்னுஐடய எடையில் 15 நவுண்டுக்கு மேல் குறைந்துள்ளது.
T	0	வழக்கத்திற்கு மாறாக நான் என்னுஐடய உடல் நலனைப் பற்றி அக்கறை கொண்டதில்லை.
	1.	உடம்பில் ஏற்படுபவன போன்ற உபாதைகளுக்காக அல்லது வயிற்றில் ஏற்படும் கோளாறு அல்லது மலச்சிகல் அல்லது மற்றுமுள்ள உடலில் ஏற்படும் விருப்பத்தகாத உணர்வுகளுக்காக என்று கவலைப்பட்டிருக்கிறேன்.
	2.	நான் எவ்வாறு உணர்கிறேன் அல்லது எனைப்பற்றி உணர்கிறேன் என்பதை நினைக்க கடினமாக உள்ளதைப் பற்றியும் அக்கறை கொண்டுள்ளேன்.
	3.	நான் எப்படி உணர்கிறேன் என்பதிலேயே முழுவதுமாக ஊன்றி விடுகிறேன்.
U	0	பால் உறவு சம்பந்தமாக உற்ள ஆர்வத்தில் என்னிடத்தில் சமீபத்தில் மாற்றம் ஏதும் ஏற்பட்டதாக எனக்கு தெரியவில்லை
	1.	இதற்கு முன்பு இருந்ததை விட இப்போது எனக்கு பால் உறவு சம்பந்தமாக சிறிது ஆர்வம் குறைந்துள்ளது.
	2.	இப்போது எனக்கு பால் உறவு சம்பந்தமானவற்றில் ஆர்வம் மிகவும் குறைவாக உள்ளது.
	3.	எனக்கு பால் உறவு சம்பந்தமானவற்றில் முற்றிலும் ஆர்வம் குறைந்துள்ளது.

Hamilton Anxiety Rating Scale (HAM-A)

Reference: **Hamilton M. The assessment of anxiety states by rating. Br J Med Psychol 1959; 32:50–55.**

Rating Clinician-rated

Administration time 10–15 minutes

Main purpose To assess the severity of symptoms of anxiety

Population Adults, adolescents and children

Commentary

The HAM-A was one of the first rating scales developed to measure the severity of anxiety symptoms, and is still widely used today in both clinical and research settings. The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety). Although the HAM-A remains widely used as an outcome measure in clinical trials, it has been criticized for its sometimes poor ability to discriminate between anxiolytic and antidepressant effects, and somatic anxiety versus somatic side effects. The HAM-A does not provide any standardized probe questions. Despite this, the reported levels of inter-rater reliability for the scale appear to be acceptable.

Scoring

Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity and 25–30 moderate to severe.

Versions

The scale has been translated into: Cantonese for China, French and Spanish. An IVR version of the scale is available from Healthcare Technology Systems.

Additional references

Maier W, Buller R, Philipp M, Heuser I. The Hamilton Anxiety Scale: reliability, validity and sensitivity to change in anxiety and depressive disorders. J Affect Disord 1988;14(1):61–8.

Borkovec T and Costello E. Efficacy of applied relaxation and cognitive behavioral therapy in the treatment of generalized anxiety disorder. J Clin Consult Psychol 1993; 61(4):611–19

Address for correspondence

The HAM-A is in the public domain.

Hamilton Anxiety Rating Scale (HAM-A)

Below is a list of phrases that describe certain feeling that people have. Rate the patients by finding the answer which best describes the extent to which he/she has these conditions. Select one of the five responses for each of the fourteen questions.

0 = Not present, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very severe.

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1 Anxious mood [0] [1] [2] [3] [4]

Worries, anticipation of the worst, fearful anticipation, irritability.

2 Tension [0] [1] [2] [3] [4]

Feelings of tension, fatigability, startle response, moved to tears easily, trembling, feelings of restlessness, inability to relax.

3 Fears [0] [1] [2] [3] [4]

Of dark, of strangers, of being left alone, of animals, of traffic, of crowds.

4 Insomnia [0] [1] [2] [3] [4]

Difficulty in falling asleep, broken sleep, unsatisfying sleep and fatigue on waking, dreams, nightmares, night terrors.

5 Intellectual [0] [1] [2] [3] [4]

Difficulty in concentration, poor memory.

6 Depressed mood [0] [1] [2] [3] [4]

Loss of interest, lack of pleasure in hobbies, depression, early waking, diurnal swing.

7 Somatic (muscular) [0] [1] [2] [3] [4]

Pains and aches, twitching, stiffness, myoclonic jerks, grinding of teeth, unsteady voice, increased muscular tone.

8 Somatic (sensory) [0] [1] [2] [3] [4]

Tinnitus, blurring of vision, hot and cold flushes, feelings of weakness, pricking sensation.

9 Cardiovascular symptoms [0] [1] [2] [3] [4]

Tachycardia, palpitations, pain in chest, throbbing of vessels, fainting feelings, missing beat.

10 Respiratory symptoms [0] [1] [2] [3] [4]

Pressure or constriction in chest, choking feelings, sighing, dyspnea.

11 Gastrointestinal symptoms [0] [1] [2] [3] [4]

Difficulty in swallowing, wind abdominal pain, burning sensations, abdominal fullness, nausea, vomiting, borborygmi, looseness of bowels, loss of weight, constipation.

12 Genitourinary symptoms [0] [1] [2] [3] [4]

Frequency of micturition, urgency of micturition, amenorrhea, menorrhagia, development of frigidity, premature ejaculation, loss of libido, impotence.

13 Autonomic symptoms [0] [1] [2] [3] [4]

Dry mouth, flushing, pallor, tendency to sweat, giddiness, tension headache, raising of hair.

14 Behavior at interview [0] [1] [2] [3] [4]

Fidgeting, restlessness or pacing, tremor of hands, furrowed brow, strained face, sighing or rapid respiration, facial pallor, swallowing, etc.

MORISKY MEDICATION ADHERENCE SCALE: MMAS – 8

1. Do you feel sometimes forget to take your pills
2. People sometimes miss taking their medications foe reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medicine ?
3. Have you ever cut back or stopped taking your medicine telling your doctor because you felt worse when you took it ?
4. When you travel or leave home, do you sometimes forget to bring along your medicine ?
5. Did you take all your medicine yesterday ?
6. When you feel like your symptoms are under control, do you sometimes stop taking your medicine ?
7. Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan ?
8. How often do you have difficulty remembering to take all your medicine ?

    A. Never / rarely
    B. Once in a while
    C. Sometimes
    D. Usually
    E. All the time

Adherence	MMAS-8 Score
High adherence	0
Medium adherence	1 – 2
Low adherence	3 – 8

KEY TO MASTER CHART

1. Age
2. Sex
    1. Male
    2. Female
3. Religion
    1. Hinduism
    2. Christianity
    3. Islam
    4. Others
4. Family distribution
    1. Nuclear
    2. Joint family
5. Residence
    1. Urban
    2. Rural
6. Marital status
    1. Married
    2. Unmarried
7. Education
    1. Profession or honours
    2. Graduate or post graduate
    3. Intermediate or post high school or diploma
    4. High school
    5. Middle school

6. Primary school
7. Illiterate

8. Occupation
1. Profession
2. semi Profession
3. Clerical/shop owner or farmer
4. Skilled worker
5. Semi skilled worker
6. Unskilled worker
7. Unemployed

9. Income (In rupees)
1. >36,997
2. 18,498 -36,996
3. 13,874 – 18,497
4. 9,249-13,875
5. 5,547- 9,248
6. 1,866- 5,546
7. <1,865

10. Socioeconomic status
1. Upper
2. Upper middle
3. Middle/ lower middle
4. Lower/ upper lower
5. Lower

11. Duration of illness

1. 5 – 10 years
2. 11 – 15 years
3. 16- 20 years
4. > 20 years

12. Complication
1. Yes
2. No

13.Hospital stays

14.Medication adherence

1. High adherence (score 0)
2. Medium adherence (score 1-2)
3. Low adherence (score 3-8)

15.BDI

1. normal (score 0 -9)
2. mild (score 10 - 16)
3. moderate (score 17 - 29)
4. Severe (score 30 -63)

16. HAM-A

1. normal (score <17)
2. Mild to moderate (score 18 - 24)
3. Moderate to severe (score 25 - 30)
4. Very severe (score >30)

MASTER CHART - DM

Age	Sex	Religion	Family	Residence	Marital st	Education	Occupation	Income	SES	Duration	Complications	Hosp.stay	Adherence	BDI	HAM-A
42	2	1	1	1	1	5	7	3	4	1	2	1	2	1	1
45	2	2	2	1	1	7	6	4	4	1	1	2	3	4	2
50	1	1	1	2	1	7	5	3	4	2	1	3	2	1	3
38	2	3	1	1	1	5	4	5	4	1	2	1	1	1	1
40	1	3	2	1	1	6	6	4	4	1	2	0	2	1	1
45	1	1	1	2	1	3	4	3	3	1	2	0	1	1	1
41	2	3	2	1	1	3	4	3	3	2	1	2	3	1	4
34	2	2	1	2	1	4	7	2	3	1	2	0	1	1	1
49	1	3	2	2	1	7	5	3	4	2	2	0	2	1	1
30	1	1	1	1	2	3	3	3	3	1	1	1	1	2	1
33	2	2	1	2	1	6	7	4	4	1	2	0	1	1	1
46	1	1	1	1	1	3	4	3	3	1	2	0	1	1	1
49	1	4	2	1	2	4	4	4	3	3	1	2	2	3	1
38	2	2	1	1	1	7	3	4	4	1	2	0	1	1	1
41	1	1	2	2	1	6	7	6	4	2	1	3	2	2	1
37	2	3	2	1	1	7	7	6	5	2	1	1	3	2	2
44	1	1	1	1	1	5	3	3	3	2	2	1	1	1	1
47	2	1	2	1	1	7	6	5	4	3	2	2	2	2	1
30	1	1	1	1	2	4	4	4	3	1	2	0	1	1	1
37	2	3	1	1	1	2	3	2	2	1	2	0	2	1	1
34	1	1	1	1	2	3	3	3	3	1	1	1	1	3	1

Age	Sex	Religion	Family	Residence	Marital st	Education	Occupation	Income	SES	Duration	Complications	Hosp.stay	Adherence	BDI	HAM-A
46	1	1	1	1	1	3	4	3	3	1	2	0	1	1	1
36	2	2	1	2	1	6	7	6	4	1	2	0	1	1	1
46	2	2	2	1	1	7	6	4	4	1	1	2	3	4	2
41	2	3	2	1	1	3	4	3	3	2	1	3	3	1	4
44	1	1	1	1	1	5	3	3	3	2	2	1	1	1	1
41	1	1	2	2	1	6	7	6	4	2	1	1	2	3	1
40	1	3	2	1	1	6	6	4	4	1	2	0	2	1	2
45	1	1	1	1	1	3	4	3	3	1	2	0	1	1	1
42	2	1	1	1	1	5	3	3	3	1	2	1	2	1	1
34	2	2	1	2	1	4	7	2	3	1	2	0	1	1	1
37	2	3	1	1	1	2	3	2	2	1	2	0	2	1	1
43	2	2	2	1	1	7	6	4	4	1	1	2	3	4	3
47	2	1	2	1	1	7	6	5	4	3	2	2	2	2	1
49	1	3	2	2	1	7	7	6	5	2	1	2	2	1	1
30	1	1	1	1	2	4	4	4	3	1	2	0	1	1	1
44	2	1	1	1	1	5	3	3	3	1	2	1	2	1	1
50	1	1	1	2	1	7	5	3	4	2	1	2	2	1	3
39	2	2	1	1	1	7	3	4	4	1	1	0	1	1	1
44	1	1	1	1	1	5	3	3	3	2	2	1	1	1	1
33	2	2	1	2	1	6	5	4	4	1	2	0	1	1	1
45	1	1	1	2	1	3	4	3	3	1	2	0	1	1	1
37	2	3	2	1	1	7	7	6	5	2	1	1	3	1	2
49	1	4	2	1	2	4	4	4	3	3	2	2	2	3	1
41	2	3	2	1	1	3	4	3	3	2	1	2	3	1	4

Age	Sex	Religion	Family	Residence	Marital st	Education	Occupation	Income	SES	Duration	Complications	Hosp.stay	Adherence	BDI	HAM-A
38	2	3	1	1	1	5	7	5	4	1	2	1	1	1	1
39	1	3	2	1	1	6	6	4	4	1	2	0	2	1	1
38	2	3	1	1	1	5	4	5	4	1	2	1	1	1	1
37	2	3	2	1	1	7	7	6	5	2	2	1	3	1	2
47	2	1	2	1	1	7	6	5	4	3	2	2	2	2	1
34	2	2	1	2	1	4	7	2	3	1	2	0	1	1	1
48	1	1	1	2	1	7	5	3	4	2	1	2	2	1	3
41	1	1	2	2	1	6	7	6	4	2	1	1	2	1	1
45	1	1	1	2	1	3	4	3	3	1	2	0	1	1	1
40	2	2	1	1	1	7	3	4	4	1	2	0	1	1	1
30	1	1	1	1	2	4	4	4	3	1	2	0	1	1	1
37	2	3	1	1	1	2	3	2	2	1	2	0	2	1	1
48	1	4	2	1	2	4	4	4	3	3	1	2	2	3	1
46	1	3	2	2	1	7	5	3	4	2	1	0	2	1	1
31	1	1	1	1	2	3	3	3	3	1	2	1	1	1	1

MASTER CHART - SHT

Age	Sex	Religion	Family	Residence	Marital Status	Education	Occupation	Income	SES	Duration	Complications	Hosp. stay	Adherence	BDI	HAM-A
46	1	1	1	1	1	4	4	3	3	2	2	0	2	1	1
38	2	1	1	1	1	6	5	5	4	1	2	1	1	1	1
49	1	2	2	2	1	7	6	5	4	3	1	1	3	1	2
42	2	3	2	2	1	7	7	6	5	2	2	0	3	3	1
31	1	1	1	1	2	3	4	3	3	1	2	0	1	1	1
39	2	3	1	1	1	6	7	6	4	1	2	0	2	1	1
42	1	1	2	2	1	6	5	4	4	2	2	0	1	1	1
47	1	3	2	1	1	6	5	3	3	1	1	0	2	1	1
49	2	1	1	2	1	4	4	4	3	3	2	1	1	1	1
36	2	1	1	1	1	7	6	5	4	1	2	0	2	1	1
38	1	1	1	1	1	2	3	3	2	1	2	0	1	1	1
43	1	3	2	2	1	5	5	4	4	2	1	3	2	1	3
44	2	1	1	1	1	4	4	4	3	1	2	0	1	1	1
41	2	2	1	1	1	7	4	3	3	2	1	1	2	1	1
39	1	1	1	1	1	4	6	4	4	1	2	0	1	1	1
48	1	3	2	1	1	3	3	3	2	3	1	2	2	1	1
43	1	1	1	1	1	6	5	4	4	1	2	0	1	1	1
38	2	2	1	2	2	6	7	4	4	2	2	0	1	1	1
34	2	3	1	1	1	7	7	6	5	1	2	0	1	1	1
39	2	1	2	1	1	4	6	4	4	1	2	0	2	1	1

Age	Sex	Religion	Family	Residence	Marital Status	Education	Occupation	Income	SES	Duration	Complications	Hosp. stay	Adherence	BDI	HAM-A
39	2	3	1	1	1	6	7	6	4	1	2	0	2	1	1
48	1	3	2	1	1	6	5	3	3	1	1	0	2	1	1
42	2	3	2	2	1	7	7	6	5	2	2	0	3	2	1
38	1	1	1	1	1	2	3	3	2	1	2	0	1	1	1
39	1	1	1	1	1	4	6	4	4	1	2	0	1	1	1
42	1	1	2	2	1	6	5	4	4	2	2	0	1	1	1
46	2	1	2	1	1	4	6	4	4	1	2	0	2	1	1
49	1	2	2	2	1	7	6	5	4	3	1	2	3	1	2
43	1	3	2	1	1	3	3	3	2	3	1	2	2	1	1
39	2	3	1	1	1	7	7	6	5	1	2	0	1	1	1
41	2	1	1	1	1	7	6	5	4	1	2	0	2	1	1
49	2	1	1	1	1	4	4	4	3	1	2	0	1	1	1
50	2	3	2	2	1	7	7	6	5	2	2	0	2	3	1
44	2	1	2	1	1	4	6	4	4	1	2	0	2	1	1
36	2	1	1	1	1	7	6	5	4	1	2	0	2	1	1
38	2	1	1	1	1	6	5	5	4	1	1	1	2	1	3
49	2	1	1	2	1	4	4	4	3	3	2	1	1	1	1
43	1	1	1	1	1	6	5	4	4	1	2	0	1	1	1
46	1	1	1	1	1	4	4	3	3	2	2	0	2	1	1
41	2	2	1	1	1	7	4	3	3	2	1	1	2	1	1
39	1	1	1	1	1	4	6	4	4	1	2	0	1	1	1
38	1	1	1	1	1	2	3	3	2	1	2	0	1	1	1

Age	Sex	Religion	Family	Residence	Marital Status	Education	Occupation	Income	SES	Duration	Complications	Hosp. stay	Adherence	BDI	HAM-A
42	1	1	2	2	1	6	5	4	4	2	2	0	1	1	1
46	1	3	2	1	1	6	5	3	3	1	1	0	2	1	1
39	2	3	1	1	1	6	7	6	4	1	2	0	2	1	1
43	1	3	2	2	1	5	5	4	4	2	1	1	2	1	1
38	2	1	1	1	1	6	5	5	4	1	2	1	1	1	1
33	1	1	1	1	2	3	4	3	3	1	2	0	1	1	1
38	2	2	1	2	2	6	7	4	4	2	2	0	1	1	1
44	1	3	2	1	1	3	3	3	2	3	1	2	2	1	1
47	1	2	2	2	1	7	6	5	4	3	1	1	3	1	3
40	2	2	1	2	2	6	7	4	4	2	2	0	1	1	1
45	1	3	2	2	1	5	5	4	4	2	1	1	2	1	2
41	2	2	1	1	1	7	4	3	3	2	1	1	2	1	1
49	2	1	1	2	1	4	4	4	3	3	2	1	1	1	1
44	2	1	1	1	1	4	4	4	3	1	1	1	2	4	1
32	1	1	1	1	2	3	4	3	3	1	2	0	1	1	1
43	1	1	1	1	1	6	5	4	4	1	2	0	1	1	1
46	1	1	1	1	1	4	4	3	3	2	1	1	2	1	3
34	2	3	1	1	1	7	7	6	5	1	2	0	1	1	1

MASTER CHART - COPD

Age	Sex	Religion	Family	Residence	Marital Status	Education	Occupation	Income	SES	Duration	Complications	Hosp.stay	Adherence	BDI	HAM-A
31	2	1	1	2	2	2	3	2	2	1	1	1	2	1	2
39	1	1	1	1	1	6	5	4	4	2	2	0	1	1	1
42	1	2	2	1	1	4	7	2	3	1	1	2	3	3	1
47	1	3	2	1	1	7	7	5	4	2	1	3	2	2	1
49	1	2	1	1	1	7	6	5	4	2	2	1	1	1	1
36	2	4	2	1	2	6	6	4	4	1	2	0	2	1	1
38	1	1	2	2	1	4	6	5	4	1	2	0	1	1	1
43	1	1	1	1	1	7	3	4	4	2	1	1	2	1	1
44	2	3	2	2	1	6	5	5	4	1	2	0	1	1	1
32	2	1	1	2	2	5	3	3	3	1	2	0	2	1	1
35	2	3	1	1	1	5	7	3	4	1	1	2	3	1	3
41	1	2	1	2	1	7	7	6	4	2	1	1	2	2	1
38	1	2	2	1	1	6	7	5	4	1	2	0	2	1	1
37	2	3	2	2	1	7	7	6	5	1	2	1	3	1	1
47	1	1	1	2	1	4	4	4	3	3	1	3	3	3	1
34	2	2	1	1	1	2	3	3	2	1	2	0	2	1	1
48	2	3	1	1	1	4	4	5	3	2	1	1	2	4	2
41	1	1	2	2	1	5	3	3	3	1	2	0	1	1	1
45	2	4	2	1	1	3	4	3	3	2	1	2	2	1	3
40	1	1	1	1	1	5	4	5	4	1	2	1	1	1	1
31	2	1	1	2	2	2	3	2	2	1	1	1	2	1	2

Age	Sex	Religion	Family	Residence	Marital Status	Education	Occupation	Income	SES	Duration	Complications	Hosp.stay	Adherence	BDI	HAM-A
36	2	4	2	1	2	6	6	4	4	1	2	0	2	1	1
47	2	1	1	2	2	5	3	3	3	1	2	0	2	1	1
47	1	3	2	1	1	7	7	5	4	2	1	3	2	3	1
39	1	1	1	1	1	6	5	4	4	2	2	0	1	1	1
47	1	1	1	2	1	4	4	4	3	3	1	3	3	4	1
49	1	2	1	1	1	7	6	5	4	2	2	1	1	1	1
42	1	2	2	1	1	4	7	2	3	1	1	2	3	3	1
38	1	2	1	2	1	7	7	6	4	2	1	1	2	2	1
45	2	4	2	1	1	3	4	3	3	2	1	2	2	1	3
49	1	2	2	1	1	4	7	2	3	1	1	2	3	3	1
39	1	2	2	1	1	6	7	5	4	1	2	0	2	1	1
35	2	3	1	1	1	5	7	3	4	1	1	3	3	1	3
41	1	1	2	2	1	5	3	3	3	1	2	0	3	1	1
33	2	1	1	2	2	2	3	2	2	1	1	1	2	1	2
40	1	1	1	1	1	5	4	5	4	1	2	1	1	1	1
43	1	1	1	1	1	7	3	4	4	2	1	1	2	1	1
37	2	3	2	2	1	7	7	6	5	1	2	1	3	1	1
41	1	1	1	1	1	6	5	4	4	2	2	0	1	1	1
47	1	1	1	2	1	4	4	4	3	3	1	2	3	3	1
48	2	3	1	1	1	4	4	5	3	2	1	1	2	4	2
34	2	2	1	1	1	2	3	3	2	1	2	0	1	1	1
39	2	3	2	2	1	7	7	6	5	1	2	1	3	1	1
43	1	2	1	2	1	7	7	6	4	2	1	1	2	2	1

Age	Sex	Religion	Family	Residence	Marital Status	Education	Occupation	Income	SES	Duration	Complications	Hosp.stay	Adherence	BDI	HAM-A
45	2	4	2	1	1	3	4	3	3	2	1	2	2	1	4
43	1	1	2	2	1	5	3	3	3	1	2	0	1	1	1
43	2	4	2	1	1	3	4	3	3	2	1	2	2	1	3
47	1	2	2	1	1	4	7	2	3	1	1	2	3	3	1
46	1	3	2	1	1	7	7	5	4	2	1	3	2	3	1
40	1	1	1	1	1	5	4	5	4	1	2	1	1	1	1
37	2	2	1	1	1	2	3	3	2	1	2	0	1	1	1
45	2	4	2	1	1	3	4	3	3	2	1	2	2	1	3
43	1	1	1	1	1	7	3	4	4	2	1	1	2	1	1
32	2	1	1	2	2	5	3	3	3	1	2	0	2	1	1
42	1	2	2	1	1	6	7	5	4	1	2	0	2	1	1
45	1	2	2	1	1	4	7	2	3	1	1	2	3	3	1
49	1	2	1	1	1	7	6	5	4	2	2	1	1	1	1
38	2	4	2	1	2	6	6	4	4	1	2	0	2	1	1
48	2	3	1	1	1	4	4	5	3	2	1	1	2	3	2
35	2	3	1	1	1	5	7	3	4	1	1	2	3	1	3